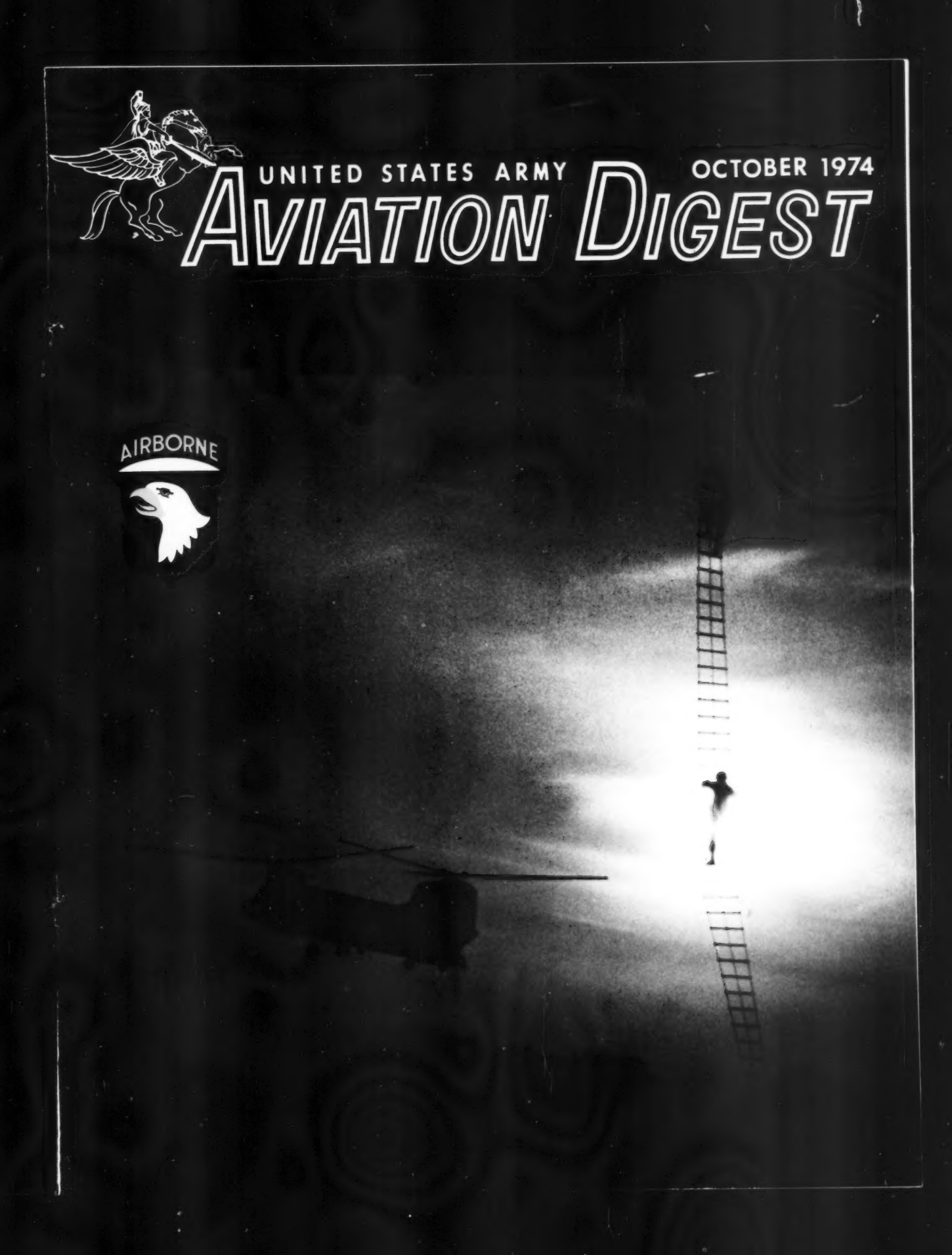
UNITED STATES ARMY

OCTOBER 1974

AVIATION DIGEST



UNITED STATES ARMY AVIATION DIGEST

OCTOBER 1974 VOLUME 20 NUMBER 10

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ABOUT THE COVER

Soldiers of the 101st Airborne Division (Airmobile) climb down ladders from CH-47 Chinook helicopters. The DIGEST thanks SP4 Bill Swartz for the picture. SP4 Swartz is assigned to Recruiting and Retention, G1, 101st Division

The mission of the U. S. ARMY AVIATION DIGEST is to provide information of an operational or functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine and other related data.

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HEADQUARTERS
101ST AIRBORNE DIVISION (AIRMOBILE) AND FORT CAMPBELL
OFFICE OF THE COMMANDER
FORT CAMPBELL, KENTUCKY 42223

AFZBIN

1 October 1974

FELLOW ARMY AVIATORS AND FRIENDS OF ARMY AVIATION

The soldiers of the 101st Airborne Division (Airmobile) have compiled an impressive list of accomplishments during the last training year.

- Following a rigorous field training program that included numerous CPXs and FTXs, the Division has attained the highest level of readiness for strategic deployment and air assault combat.

- Every unit has validated its combat readiness with an operational readiness training test in the field. Over fifty percent of the combat assaults and artillery insertions were conducted during the hours of darkness.

- On April 6th the first class graduated from the Division's Air Assault School. More than 1,100 Screaming Eagle soldiers now wear the Air Assault Badge earned by demanding challenging work.

The challenges of the coming year include refinement of our methods and techniques of air assault, and preparation for acceptance of any mission as the Army's most ready and versatile division.

The doctrine of air assault as employed in our division gives us unparalled tactical mobility. Our inherent strategic mobility, high combat readiness and traditional fighting spirit will assist us in preparing for wherever our "Rendezvous with Destiny" may lead us.

Your continued interest, enthusiasm and support of the evolving air assault doctrine is vital to our efforts to sustain and improve our country's only airmobile division.

JOHN W. McENERY
Major General, USA
Commanding

The Airmobile Assault Badge, shown here in front of the famous 101st Airborne Division (Airmobile) patch, recently was authorized for wear by Screaming Eagles who complete the division's Air Assault School

WHEN THE 101st Airborne Division was formed at Camp Claiborne, LA, in 1942 those volunteering to serve with the Screaming Eagles faced a challenge which few Americans—even if they were seasoned soldiers—had faced: parachuting. But they met the test and proudly wore their jump wings.

At the same time a substantial portion of the division was to go into combat in World War II by means of "unconventional" method: the glider. Realizing the inherent danger in riding those silent, engineless, winged machines into battle, Major General William C. Lee, the original Screaming Eagles commander, declared that the selection, physical standards and special training for the glider soldiers must approximate that established for parachute troops.

Today, the newest technology in deploying troops in ground combat involves the use of the helicopter with airmobile tactics. Once again Screaming Eagles are meeting the challenge of taking a combat concept and refining its techniques and tactics so that they may be successfully employed against a high air defense threat on the battlefield.

On 1 February 1974 Major General Sidney B. Berry, then the 101st commander, approved the Air Assault Badge for wear by Screaming Eagle soldiers who earn it. On 6 April 1974, 49 soldiers stood tall as the first Air Assault Badge was pinned on Major James I. Daily, commandant of the 101st Division Air Assault School. Sergeant First Class Robert E. Walker, NCO in charge of the school, received the second badge from General Berry.

Air Assault School

Captain Paul Fardink
101st Airborne Division (Airmobile)

TACTICS TRAINING outlook

A NEW CHALLENGE awaits the Screaming Eagles at their 101st Airborne Division (Airmobile) Air Assault School at Fort Campbell, KY. The school which was opened the first week of April 1974 tests soldiers both physically and mentally. For those who meet this challenge the reward is the Air Assault Badge and personal self-satisfaction that they have met the sternest of tests.

Before a person can enter the Air Assault School, he must be assigned to an airmobile unit for a minimum of 90 days. He must be qualified in his particular military occupational specialty (MOS) and a qualified marksman or better with his assigned individual weapon. He must be rated excellent in both conduct and efficiency by his commanding officer and *volunteer* for the course. When these criteria have been met, he must pass the Ranger/Special Forces physical fitness test, minus the 2 mile swim; score at least 60 points in each of the test's five events; and at least 350 points overall. Each soldier must be physically fit to meet the tough physical demands of the course.

Once enrolled, a candidate for the Air Assault Badge first studies the basics of airmobility. The veteran cadre, all graduates of the much tougher instructor course, teach the basic concepts of combat assault by infiltration and nap-of-the-earth (NOE) flight. He learns basic pathfinder methods and how to adjust aerial field artillery fires. A soldier/student also learns the techniques of aerial medical evacuation. Then he moves out of the classroom and "meets" the equipment that he will have to move correctly and quickly about the airmobile battlefield. He learns how to rig the M151A2 ¼ ton truck; the M274 ½ ton truck (Mule); the M561 1¼ ton truck (Gamma Goat); and the M102 105 mm howitzer with an A-22 container in piggyback style for aerial movement via slingloads.

The Air Assault School student participates in both day and night combat assaults, selecting his own pickup and landing zones. During these operations he has to call in a medevac aircraft to evacuate casualties; adjust live aerial field artillery fire; prepare cargo for slingloading; and direct the hookup of the UH-1H Huey or CH-47 Chinook helicopters.

Several of the insertion and extraction techniques taught the students are as demanding on the helicopter pilots of the division as they are for the students. One such technique is the troop ladder.

A troop ladder is constructed of 3 foot lengths of aluminum pipe and ¼ inch cable and suspended from the tailgate of a CH-47 hovering 50 feet above the ground. Each in a group of 30 soldiers climbs the ladder, straps himself into the helicopter and then descends the ladder in the order he climbed it. The process takes an average of 40 minutes and is done at least once during both daylight and darkness. The process is fatiguing for the aviators as well as the climbers.

As a safety measure each climber wears a rappell seat so that if he should become excessively fatigued, he can fasten his snap link into the ladder and take a short rest. The snap links also serve another purpose; for example, during a mission calling for the extraction of a small unit of soldiers

CPT Fardink is a graduate of the 101st Division Air Assault School. He is a qualified aviator and has flown for the 101st Airborne Division (Airmobile). He also is a graduate of the Airborne and Ranger Schools and has served with the 1st Infantry Division

Photo by SP5 Charles Drake

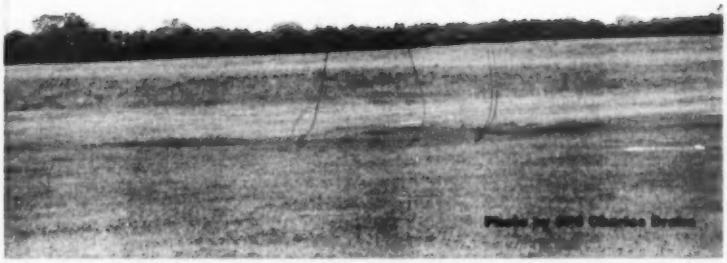
where landing is impossible and speed imperative. The rescuers can climb the ladder high enough to get everyone aboard the hovering helicopter, fasten their snap links to the ladder, and then ride beneath the aircraft as it departs the area. This method was used successfully in Southeast Asia.

One concept being revived and studied is the use of the tree landing platform (see "Limited War Laboratory," September 1963 DIGEST). Called the "spider" because of its aluminum pipe and wire mesh construction, the tree landing platform (TLP) is made for insertion in triple canopy or heavily forested areas where no pickup or landing zones are available. TLP comes equipped with a radio and a winch to lower and raise wounded or supplies through one of its two rappelling points. Air Assault School students are inserted onto the platform in groups of four and then rappell to the ground 80 feet below. Pilot technique is extremely important since the helicopter must hover adjacent to the platform while the students unload.

Another technique the student must master is helicopter rappelling. Several rappells are made from a 60 foot height, with the final rappells being made at 100 feet during both daylight and darkness. The students learn the required knots and the proper rigging of the aircraft for these operations. And, once more, holding a helicopter steady at night while soldiers rappell to the ground 100 feet below is not the simplest task in the world for an Army aviator.

The troop ladder is one of the hurdles for students of the 101st Airborne Division (Airmobile) Air Assault School. The students earn the Air Assault Badge upon completion of the week long course

Above, the helicopter tree landing platform is about to be landed in preparation for another Air Assault School class to rappell down through the branches of the tree. The tree landing platform is being tested at Fort Campbell and is designed to land soldiers in triple canopy terrain where no other landing zone is available. Below, this is what the tree landing platform looks like when in use from the ground. Four soldiers at a time are landed onto the platform and rappell down to the ground through the branches and other obstacles



Soldiers from the 2d Battalion, 101st Airborne Division (Airmobile) show how a squad could be inserted into a heavily wooded area when no landing zone is available

During the course of instruction the student is required to pass two written examinations; a midcourse and a final exam. The written exams contain material not covered during the practical exercise testing. As the demanding 5 day course nears completion, the student's final standing is compiled from spot reports, daily inspection deficiencies, a fellow student evaluation report and a tactical evaluation.

Finally, when the graduating Air Assault School candidate stands at attention to receive his badge of distinction he knows he has met a challenge both physically and mentally. He has earned the Air Assault Badge and demonstrated his proficiency in a variety of airmobile techniques and skills. He has shown a thorough knowledge of those helicopters organic to the airmobile division and their uses in airmobile operations.

When the Air Assault School graduate returns to his unit in the Army's only airmobile division he is better prepared to fulfill his mission and to train others in his unit.

He is ready to meet the challenge of the future whether it be in training or combat in which we face a high enemy air defense threat.

From A Ground Commander

To The Aviator

Brigadier General Hillman Dickinson

Deputy Director of Combat Support Systems
Office of the Chief of Research
Development and Acquisition

BG Dickinson discusses the need for aviators in ground assignments, the correct use of NCOs and enhancement of aviation command opportunities

DOES THE GROUND commander want aviators assigned to command in his unit? At least in the case of the Ft. Knox Armor Training Center at Ft. Knox, KY, I can say without qualification, "Yes!"

Does the aviator on his first ground tour have to learn new methods, does his career benefit, and does he enjoy it? Again, my answer to these questions is "Yes!"

Recently, the number of aviators in command of Armor companies in the Training Center reached 50 percent. Many of these were serving their first tours on the ground, having been on repetitive flying assignments during the Republic of Vietnam war period. Their fine performance reflects the quality of the Army aviator in our Army. Yet, there are significant blanks in experience which must be quickly filled when a command is assumed.

Obviously in Armor there is new hardware to learn to use and maintain. Aviators can do this quickly and well. But far more important (and applicable to any type ground unit) is the need to learn to use the commander's most valuable asset, the ground noncommissioned officer (NCO). These men form the backbone and the heart of any good unit.

The ground NCO is quite different from the soldier in aviation units. Perhaps the most difficult thing for an aviator assuming command to learn is that the NCOs should be allowed to operate the unit. To an officer coming from aviation units composed of 50 percent officers and warrant officers, it is difficult to comprehend the difference in magnitude and scope of the ground NCO's responsibilities. Yet, this comprehension is a first essential step in becoming a ground commander.

The commander must exploit the experience and leadership of the competent NCOs. There is no better procedure for a new commander than to consult with his key NCOs before making changes in policies and standing operating procedures. They are an invaluable source of knowledge about what has worked and what has failed in the past. The NCO should be the key operator in all daily aspects of running the company from military instruction to assisting the families of his men.

The officer sets standards, requires compliance, plans and supervises, but the best units are those in which day-to-day matters are run by the NCOs. The responsibility for the day-to-day operation must be given to them and NCOs must be required to assume responsibility if the unit is to function up to its capability.

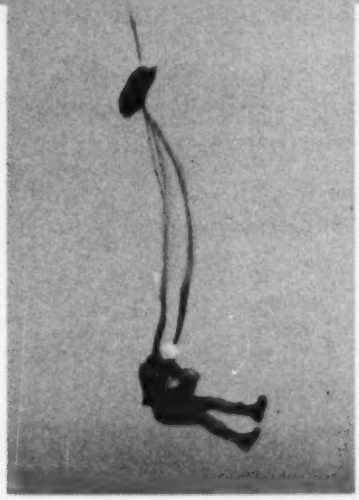
Other habits some aviators acquire while assigned to aviation units are excessive familiarity with superiors and subordinates (which leads to poor discipline) and failing to get personally involved with maintenance (perhaps caused by past reliance on the crewchief and maintenance personnel to have the

BG Dickinson, West Point 1945, holds a doctorate in physics from Stevens Institute of Technology. From August 1973 to June 1974 he was the Deputy Commanding General of the U. S. Army Armor Center, Fort Knox, KY

aircraft ready). These habits should be left behind when reporting to ground assignments, otherwise problems soon follow.

There is no substitute for ground duty experience, but will the effort be worthwhile? The answer is clear to aviators with this experience. Before my departure for a graduation address at the U. S. Army Aviation Center, Ft. Rucker, AL, recently, one of the top colonels at Ft. Knox said, "Tell them the key to my selection for command of an aviation battalion was my ground experience." The same story is retold in the results of each selection and promotion board.

The best way for an aviator to appreciate the capabilities, limitations and problems of the ground unit he supports is to have served on the ground. If he has this experience the Army aviator can truly support the Army best. Perhaps more immediate is the satisfaction to be found in the challenge of a ground assignment.



From aviation . . .

to a ground assignment

One captain in an Armor brigade said recently, "Since the emergency in Vietnam is over, many aviators feel down because there is no more excitement in being a soldier. I feel an Armor ground assignment, especially command, is one of the most exciting and fun experiences I have found in the U. S. Army."

A battalion commander said, "As a Master Army aviator presently in command of a ground unit, and having held command positions at platoon and company level of both aviation and ground units, I have found the challenge, the reward and the professional satisfaction greater while in command of ground units. The Armor aviator must be an Armor officer first and foremost and an aviator as an important but additional skill."

The challenge is waiting. The experience of learning to work with the ground NCO is essential for a well-rounded officer and a job which is both fun and exciting may be yours if you join a ground unit.

Strategic Deployment of the 101st

The author tells the composition of the current airmobile division and the emphasis on deployment in division training. He also refutes the misconception that an extensive "get well" period is needed for aircraft reassembly at the deployment destination. Below, a CH-47 Chinook is squeezed into an Air Force C-141 during a deployment exercise

Major Roger J. Tancreti
Division Transportation Officer
101st Airborne Division (Airmobile)

STRATEGICALLY DEPLOYING elements of the Armed Forces to any location in the world is not a new venture. During the nearly two centuries of its existence the United States has deployed its forces overseas no less than six times by sea, air or a combination of these modes. REFORGER, an acronym for Redeployment Forces Germany, units annually are tasked to deploy to exercise areas under a strategic setting (see "REFORGER I," May 1969 DIGEST). The 101st Airborne Division (Airmobile) has joined the Army's other divisions in being prepared to deploy its forces to distant global locations at any time. However, preparing an airmobile division for deployment by air—or a combination of air and sea—is an experience to say the least.

The basic fundamental procedures are used but they are modified and adjusted within the division's implied missions to meet the equipment and troop densities of the many and varied subordinate units.

For anyone unfamiliar with the current airmobile division, several significant aspects of the 101st Division are highlighted here. This will allow a better appreciation of the deploying force. There are nine light airmobile infantry battalions organized into three airmobile brigades. There are three 105 mm howitzer battalions in the division artillery. The aerial field artillery battalion provides the extension of the division's fire support with 36 rocket firing AH-1G HueyCobras. More than 50 percent of the division's 422 helicopters are contained in the division aviation group which has two assault helicopter battalions each with 60 UH-1H Hueys and 12 escort Cobras and an assault support helicopter battalion consisting of 48 CH-47 Chinooks. The air cavalry squadron has three air cav troops, one ground troop and a headquarters troop. The Division Support Command (DISCOM), the largest major unit, consists of ground maintenance, aircraft maintenance, supply and medical battalions. Rounding out the division units are signal, engineers and towed Vulcan air defense battalions.

Slim AH-1G HueyCobras can be loaded into an Air Force C-141 side-by-side and deployed to destination within 24 hours

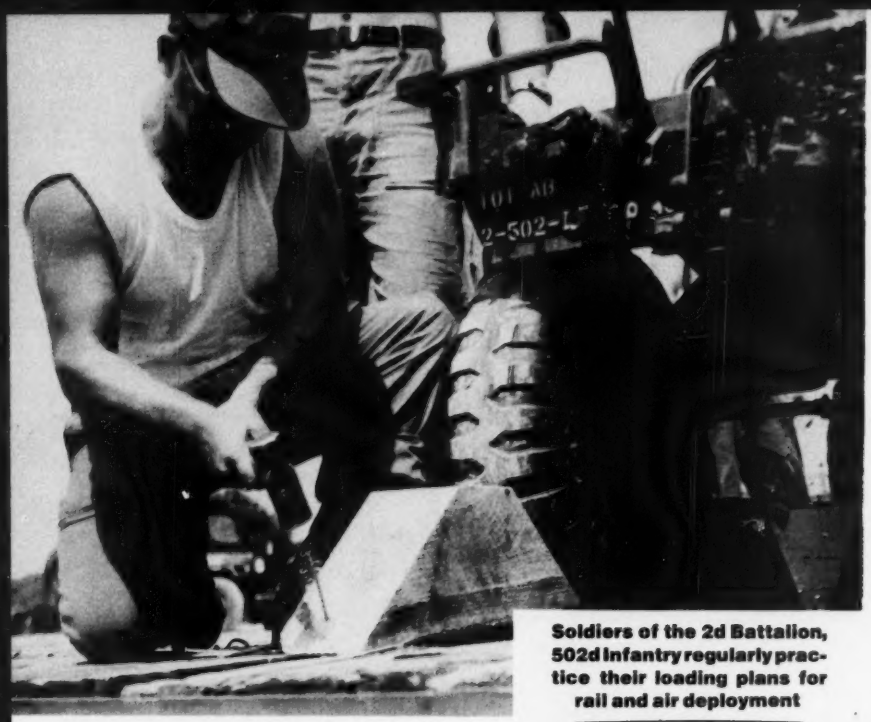
Since January 1973 the 101st Division has been emphasizing strategic deployment as an inherent part of its overall training program. Planning includes a slow methodical establishment of the basic groundwork for future activities. This is primarily because of other equally important priorities of learning to fight together as an airmobile division.

The first step in deployment planning was development and maintenance of standard unit movement data (UMD), which is a detailed listing of data reflecting the unit's personnel strength and a complete description of the unit's equipment and supplies for movement plans. The computerized movement planning and status system (COMPASS) is the vehicle used to develop UMD. This is a management tool that aids the commanders in movement planning and standardizes the unit's reporting procedures to U. S. Army Forces Command (FORSCOM).

Following compilation of the necessary movement data the division requires unit load plans for each mode of transportation. A good load plan complements a good unit movement plan. The details range from vehicle load card information to outloading plans for air or rail. In essence, each load plan by different modes specifies in detail what equipment is to be loaded on what type transport and how.

Simultaneously, one of the first steps taken in the development of deployment planning was the establishment of the 101st Airborne Division (Airmobile) Air Transportability School in early 1973. The school offers a 6 day course taught by selected noncommissioned officers (NCOs) from DISCOM. The course (given twice a month) places heavy emphasis on unit air load planning and preparation, driver training on aircraft mockups, safety procedures and practical application in the development of air load teams.

Each battery, troop, company and battalion headquarters is re-



Soldiers of the 2d Battalion, 502d Infantry regularly practice their loading plans for rail and air deployment

101st soldiers ready TOE equipment for rail shipment. The division contains three 105 mm howitzer battalions

quired to have a unit air movement control officer (AMCO) and an NCO who are graduates of the Air Transportability School. Selected personnel at the major unit command level are required to be graduates of the air transportability planning course taught at Fort Eustis, VA.

In coordination with other unit graduates, the AMCO and NCO serve as a training cadre to propagate the school's teaching and prepare their units for strategic deployment. This helps assure that, based upon the mission and guidance for higher headquarters, load tables and plans for each type of U. S. Air Force aircraft are developed for each unit or task force element in the division.

To validate these loading plans and improve on deployability procedures, C-130, C-141 and C-5A aircraft are programed for use at Fort Campbell, KY, on a regular basis. The C-5As are scheduled for practice loads at least twice a quarter for 3 days each while the C-130s and C-141s alternately are programed monthly for several days at a time. Through actual hands-on training, the units practice processing, manifesting and loading their equipment, rolling stock and rotary wing aircraft.

Loading includes the practice loads on C-5As of 3 CH-47 Chinooks with minimum disassembly; combinations of 7 UH-1H Hueys and AH-1G Cobra helicopters; and 10 OH-58 Kiowa observation helicopters. Also included are the division's outsize equipment such as 5 ton wrecker, 6,000 pound forklift and the Support Command's IBM 360-30 computer system.

The C-141s and C-130s are used to outload the smaller rotary wing aircraft along with the unit's rolling stock and personnel.

During the past year all division units conducted strategic deployability training with elements of the Military Airlift Command

(MAC) and the Tactical Airlift Command (TAC). More than 80 aircraft training days were devoted to this training. Approximately twice as many aircraft days are programed for the next year. One of the side benefits derived was the development of a modular planning system that now allows the division to estimate quickly and plan around airlift requirements necessary for the deployment of any size force package to any spot in the world.

The culmination of air movement training is the conduct of actual flyaway exercises during which units deploy to simulated forward airfields, assemble and conduct their primary missions. The first of these operations took place in early 1974 by an infantry company, followed by a no-notice alert to an artillery battalion, then a multiorganizational task force was given 24 hours to deploy. During the fall/winter and spring timeframe all of the brigade task forces will be participating in this type of training as part of their operational readiness evaluation tests.

One example of a flyaway mission was Brave Shield IX which took place in July/August 1974. During Brave Shield IX an Army forces headquarters, a brigade sized task force, and an aviation task force deployed to staging areas near Fort Polk, LA, where they assembled and carried out assigned operations.

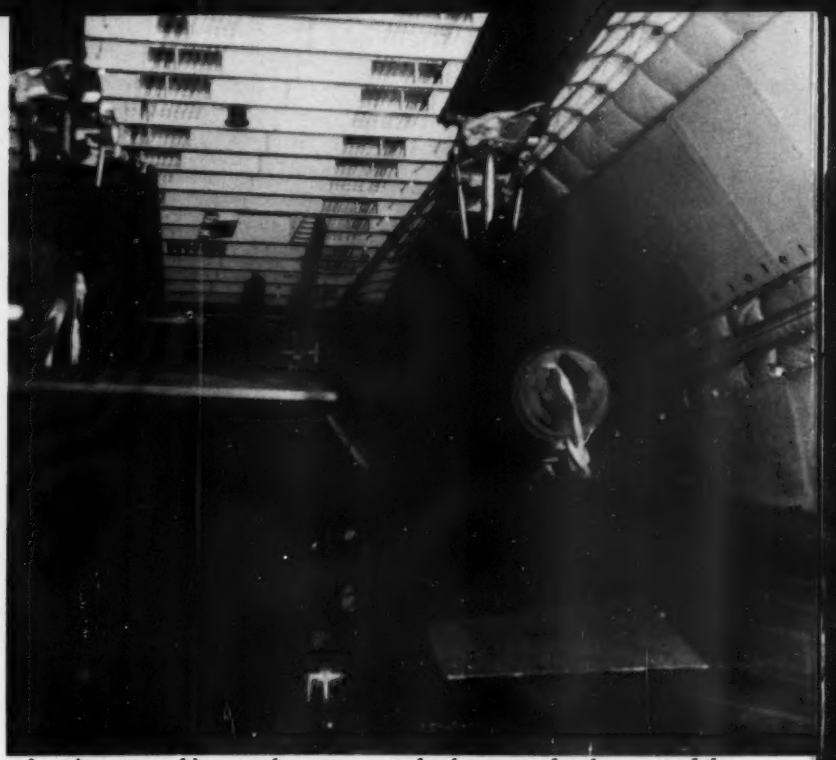
A common misconception associated with the airmobile division is that an extensive "get well" aircraft maintenance period is required for reassembly after the aviation element reaches its deployment destination. Proper planning to phase the Army aircraft and their maintenance support will greatly reduce this "get well" period. To further reduce aircraft downtime the UH-1s, AH-1Gs and OH-58s can be programed to go by C-5A. In this manner the stabilizer bar, whip antennae, and side door and sink elevators are the only items to remove. To reassemble these aircraft to operational status, including a mandatory test flight, would take about 45 to 60 minutes.

The aircraft posing the most concern from the standpoint of maintenance man-hours required is the CH-47. Major considerations for Chinook deployment are:

- Sufficient maintenance personnel, 7 to 10 per aircraft, must be available to perform the required maintenance and prepare the aircraft for deployment.
- The proper number of deployment kits must be available to store and preserve properly the components of the CH-47 during deployment. Chinook deployment kits are in short supply and the three

Drivers must know how to load and rig their vehicles for air transport aboard several MAC and TAC aircraft

UH-1 Huey is loaded aboard a MAC C-141 Starlifter during one of several 101st deployment exercises last summer



AH-1Gs deployed by giant transport aircraft are mission ready in an hour after arrival

periodically available at Fort Campbell for training are on loan from New Cumberland Army Depot. There are about 40 kits available in the entire inventory with none in production. Procurement costs exceed $10,000 each.

• Extensive maintenance is required to prepare a CH-47 for deployment (approximately 160 man-hours) and to reassemble the aircraft and return it to flyable status (about 180 man-hours). It should be noted that this man-hour requirement compares favorably with official New Cumberland Army Depot maintenance disassembly and assembly statistics.

Perhaps the biggest concern is to ensure that there are an adequate number of maintenance teams and that they continue to train together, to learn new and better techniques and thus reduce the overall maintenance downtime. The shortage of maintenance kits can be overcome with additional money.

Skilled maintenance men are a crucial element in achieving successful deployment and a minimum "get well" period

In addition to movement by air, an equally important unit planning process is the development of rail data. This is to support the rail shipment of the tables of organization and equipment, minus Army aircraft, to the port of embarkation where it is sealifted to the final destination. The aircraft are programed to self-deploy to designated ports of embarkation. All division units are required to have rail load tables and plans to include container requirements for bulk equipment using an average flat car length of 52 feet.

With the requirements determined for the various facets of transport, the division has the flexibility and increased potential to deploy from Fort Campbell by any one mode or a combination of modes. Based upon a given mission and subsequent development of the task organization a carefully assembled division movement plan is put into operation. For example, a brigade task force with or without rotary wing aircraft is scheduled to deploy by air. While the air element is preparing and finalizing plans, rail cars and/or motor transport carriers are loaded out at Fort Campbell.

Strategic deployment is the responsibility of everyone in the division. It begins with the individual driver who must know how to prepare his vehicle for shipment and outload on both aircraft and rail cars. As new information and new lessons are learned by members of the 101st Airborne Division (Airmobile), they are incorporated into the strategic deployment planning system which is thereby continually improved upon.

MAJ Tancreti is serving with the 101st Airborne Division (Airmobile) as Division Transportation Officer. In this capacity he is a key figure in assuring a smooth loadout of Fort Campbell units during strategic deployment. He has served in Vietnam with the 1st Cavalry Division's Transportation Section and as the 1st Brigade's Transportation Officer. The author has also helped to establish the Air Transportability School and a system of unit traffic managers from brigade down to company level

VIEWS FROM READERS

Sir:

I was saddened to read in yesterday's *St. Louis Post-Dispatch* that Major General Robert M. Danford, USA Retired, had passed away in Stamford, CN, at the age of 95.

General Danford (right) was the Army's last Chief of Field Artillery and had retired early in 1942 when the Army was reorganized and the chiefs of branches and services were eliminated.

While General Danford's accomplishments were many, your readers may not know that present-day Army aviation owes its start to General Danford. As Chief of Field Artillery it was General Danford who directed the commandant of the Field Artillery School to organize and train two detachments of pilots, mechanics and observers for the purpose of employing Piper Cub airplanes as spotters for the Field Artillery. After 2 months of training these two detachments were fielded, one with the 2d Division Artillery and the other with the 13th FA Brigade for test.

A short period of test proved the concept and on 6 June 1942 the War Department approved the inclusion of Air OP sections as a permanent part of each field artillery gun and howitzer battalion.

Truly, General Danford was a godfather of Army aviation and I believe all field artillerymen and others in the Army owe him a special salute!

With best wishes for continued success of the DIGEST.

COL Delbert L. Bristol
U. S. Army, Retired
27 Ranchview Drive
Florissant, MO 63033

• In a future issue of the DIGEST an article will be published covering General Danford's contributions to Army aviation.

Sir:

As an active participant in my unit's Aviation Safety Program, I find AVIATION DIGEST to be of great value both to myself as well as my fellow pilots.

In a continuing effort to improve our safety program, I wish to establish and maintain a library of AVIATION DIGESTs in my operations office.

I request that you provide me with back copies of AVIATION DIGEST from January 1972 through May 1974.

Your cooperation in this area will be greatly appreciated and your reward will be a safer operation at HHC, 222nd Aviation Battalion, home of the "RAMROD FLIGHT."

1LT Ralph R. Klink
Operations Officer
HHC, 222nd Avn Bn
APO Seattle 98731

• Available back issues are in the mail.

Sir:

After reading the article "DUSTOFF —When I Have Your Wounded" (May 1974 DIGEST), one might be left with the impression that the DUSTOFF mission was flown only by MSC aviators.

There is no doubt that Majors Kelly and Brady "exemplify the dedication of the Army Medical Department." I personally believe, however, that any recap of aeromedical evacuation in RVN must also include equal recognition of the warrant officers whose dedication is exemplified by CW4 Michael J. Novosel (see "Honor Times 29," January 1974 DIGEST).

In numbers alone, the warrant officers represented more than 50 percent of the aviators assigned to air ambulance units. More importantly, they performed their duties (including a significant number of their units' additional duties) in a highly professional manner. Without them, it is doubtful that the overall success of aeromedical evacuation in RVN would have been realized.

MAJ John D. Colvin III
Aviation Safety Officer
USAAAVS
Fort Rucker, AL 36360

INSTRUMENT CORNER

When has an approach been initiated?

An approach is initiated when the pilot commits himself to the execution of a particular instrument procedure. This action may be taken after having received ATC clearance, or under the assumed clearance executed under lost communications rules, provided that the regulatory requirements of AR 95-1, page 4-7, para 4-26f (1)(2), have been met.

Intensified Aerial Intelligence Collection

Captain Domenic R. Sette
101st Airborne Division (Airmobile)

TACTICS TRAINING outlook

The intensified aerial intelligence collection effort of the 101st Airborne Division (Airmobile) has helped to bridge the gap between the intelligence and the firepower and mobility function of our combat forces

JUST PRIOR TO HIS retirement, Lieutenant General Harry W. O. Kinnard, who commanded the U. S. Combat Developments Command, stated, "In comparison to improvements in firepower, mobility, command control and communications, and combat service support, the Army has lagged in developing its fifth function of land combat intelligence."

By the mid-1960s, the Army achieved major improvements in the firepower and mobility functions of combat through advanced technology. This provided new dimensions for the combat forces on the battlefield (the airmobile division was a product of this intensified management effort). It became apparent, however, that the intelligence function was not equal to the new environment, causing the other functions to operate below their developed capabilities.

A number of test organizations were established (such as the Modern Army Selected System Test, Evaluation and Review, better known as MASSTER) to offset this imbalance and to identify the best methods with which to gather information and to make it available to the commander in a timely manner. These tests continue and will no doubt exert a profound impact on the Army of the future. What confronted the commander of the 101st Airborne Division (Airmobile) in the spring of 1972, however, was the same gap between the ability to "move, shoot and communicate" on the one hand, and the ability to gather and assess the necessary information leading to timely decisions on the other.

A specific problem which widened this gap was the fact that the 101st Division had no organic night aerial surveillance capability. This serious deficiency was compounded because XVIII Airborne Corps lacks an aerial surveillance (OV-1 Mohawk) company and cannot support the division in this regard with organic assets. Without Mohawk support the division was lacking Army aerial photography, infrared (IR) and side looking airborne radar (SLAR) sensor capabilities. A requirement existed for a real-time, visual surveillance system.

Another problem unique to the airmobile division was the necessity to gather information over a larger than normal size division area of operations (AO). Due to its light and mobile configuration, the division could expect to operate over vast areas for short periods of time. This requires an intelligence capability which is equally flexible and immediately responsive.

The burden of narrowing the gap in this decade old problem ultimately rested with the Reconnaissance and Surveillance Branch of G2 of the 101st Division. To capitalize on the advances in firepower and mobility unique to this airmobile division, an intensified aerial intelligence collection program was established. The division intelligence program continues to rely on U. S. Air Force reconnaissance for large scale, large area photographic coverage. Although the air-ground operations system is an integral part of the aerial collection efforts of this division, the system was not designed for quick re-

Hand-held IR

sponse to fluid airmobile situations. Thus, we come to the organization that forms the nucleus of the organic aerial intelligence collection effort—the air cavalry.

The air cavalry squadron is the division's most valuable agency for collection of intelligence in areas not occupied by ground troops. The ability of the air cavalry team to cover vast, remote areas of the division's AO at low levels and to observe (at close range) indications of enemy activity are examples of the way this unit extends its reconnaissance and security capabilities.

During training exercises typical missions assigned to the air cavalry have been route and area reconnaissance within the division's AO. Information provided is quickly passed to the G2 targeting section for "follow on" strikes by organic or supporting fire support elements. Missions for the most part are controlled and/or coordinated at division level by specific G2 generated requirements tasked to the air cavalry by the G3. Once the mission is complete or information is obtained, the results are immediately processed and coordinated by the

TVT

TVT Flight

reconnaissance and surveillance branch of G2, in concert with the G3 Air to ensure that subsequent requirements are established and met.

Another organization unique to the aerial intelligence collection effort, and equally vital to a number of ongoing reconnaissance and surveillance projects which are evaluating new concepts, is the aerial surveillance platoon of the general support aviation company. The mission of the surveillance platoon is to furnish the airmobile division with aerial reconnaissance, surveillance and target acquisition support. To perform its mission the platoon is authorized six UH-1M Huey helicopters. Since the authorized forward looking infrared (FLIR) surveillance system (which would provide a night surveillance capability) is not in the Army inventory, the division reconnaissance and surveillance branch of G2 established a program to utilize the surveillance platoon as a day-night intelligence collector capable of employing a number of items of equipment which have yet to be adopted as standard in the Army inventory. One such item of equipment is the television video tape (TVT) used in the hand-held mode by a trained technical observer from the Imagery Interpretation Platoon, 101st Military Intelligence Company. Flying over or near the objective area or reconnoitering future or potential helicopter landing zones the TVT has proven effective in providing ground and air commanders with

TVT Briefing

reliable near "real-time" reconnaissance. Upon completion of his mission, the operator has the ability to land in a battalion assembly area and to brief commanders and pilots, indicating obstacles, best avenues of approach, enemy activity or other pertinent information. All of this is accomplished with the instant total recall of video tape.

Another project established by the G2 Reconnaissance and Surveillance Branch and supported by the surveillance platoon, is the division's hand-held camera program. The objective of this program is to train personnel in units with tables of organization and equipment (TOE) authorized aerial cameras (brigade headquarters, air cavalry, division artillery) to operate their camera equipment and to gain appreciation of the value of supplementing visual reconnaissance with photographs.

The surveillance platoon also has assisted in the development of a night reconnaissance capability through the testing of night vision goggles (AN/PVS-5) and a hand-held infrared device (AN/PAS-7). These devices were acquired for testing purposes from the Night Vision Laboratory, Alexandria, VA. The initial testing of these two devices for night aerial reconnaissance at low level has proven the worth of these devices to the intelligence effort. The night vision goggles are superior to the starlight scope (AN/PVS-2A), providing good resolution up to altitudes of 1,000 feet. Additionally, the hand-held infrared device is capable of detecting cooking fires and vehicles at the same altitude. Highways, trails and streams are also easily recognizable during hours of darkness using the latter device.

Night Vision Goggles

During field training exercise Quick Eagle IV, the aerial surveillance platoon flew 20 hand-held camera missions, 13 television video tape missions and 12 visual reconnaissance missions. These missions resulted in the reconnaissance and surveillance branch providing the participating units with 216 aerial photos, 1½ total hours of television video tape, and 12 briefings to brigade, battalion and company commanders.

An aerial camouflage detection program also has been initiated with the help of the surveillance platoon. This program utilizes the existing visual observer, hand-held photography and TVT capabilities.

The aerial surveillance platoon has been instrumental and active in providing reconnaissance/surveillance support during field training exercises that would be otherwise unavailable to the airmobile division. This same support could be provided, dependent upon enemy capabilities, in a combat environment.

An additional aerial collection capability is provided by the 400 plus aircraft organic to the airmobile division. Their ability to operate free of terrain interference provides a capability to conduct surveillance over vast areas in relatively short periods of time. An intelligence spot report net, facilitating the rapid reporting of enemy sightings and intelligence information by all division aircraft, was a logical development. In addition to controlling the aircraft in their respective AO, air traffic control personnel also receive inflight spot reports over their radio nets and immediately pass this information to intelligence personnel. The system is predicated upon well-trained, disciplined aviators capable of flying the aircraft, continuing their assigned missions, and reporting information of intelligence value.

The intensified aerial intelligence collection effort of the 101st Airborne Division (Airmobile) has assisted in bridging the gap between the intelligence function and the firepower and mobility function of our combat forces. However, the foregoing description is only a part of the overall intelligence effort that must be integrated with other information from subordinate, adjacent and higher headquarters and managed effectively to provide the most complete picture possible of the enemy, the weather and the terrain to enable the commander to make the best possible tactical decisions.

CPT Sette received his commission in 1964 upon graduation from the ROTC program. His military schooling includes the Air Defense Officers Basic Course and the Airborne School in 1964, and the Military Intelligence Officers Advanced Course in 1972. In Vietnam he served as a Province Intelligence Advisor, after which he was assigned as an instructor at the Infantry School in 1969. CPT Sette served as chief, Reconnaissance and Surveillance Branch of G2, 101st Airborne Division (Airmobile), from Sep 73 to Jun 74. He is completing work on his Masters degree and is currently assigned as the Assistant G2 for Operations, 101st Airborne Division (Airmobile).

Aeromedic

Human Factors In Nap-of-the-Earth Flying

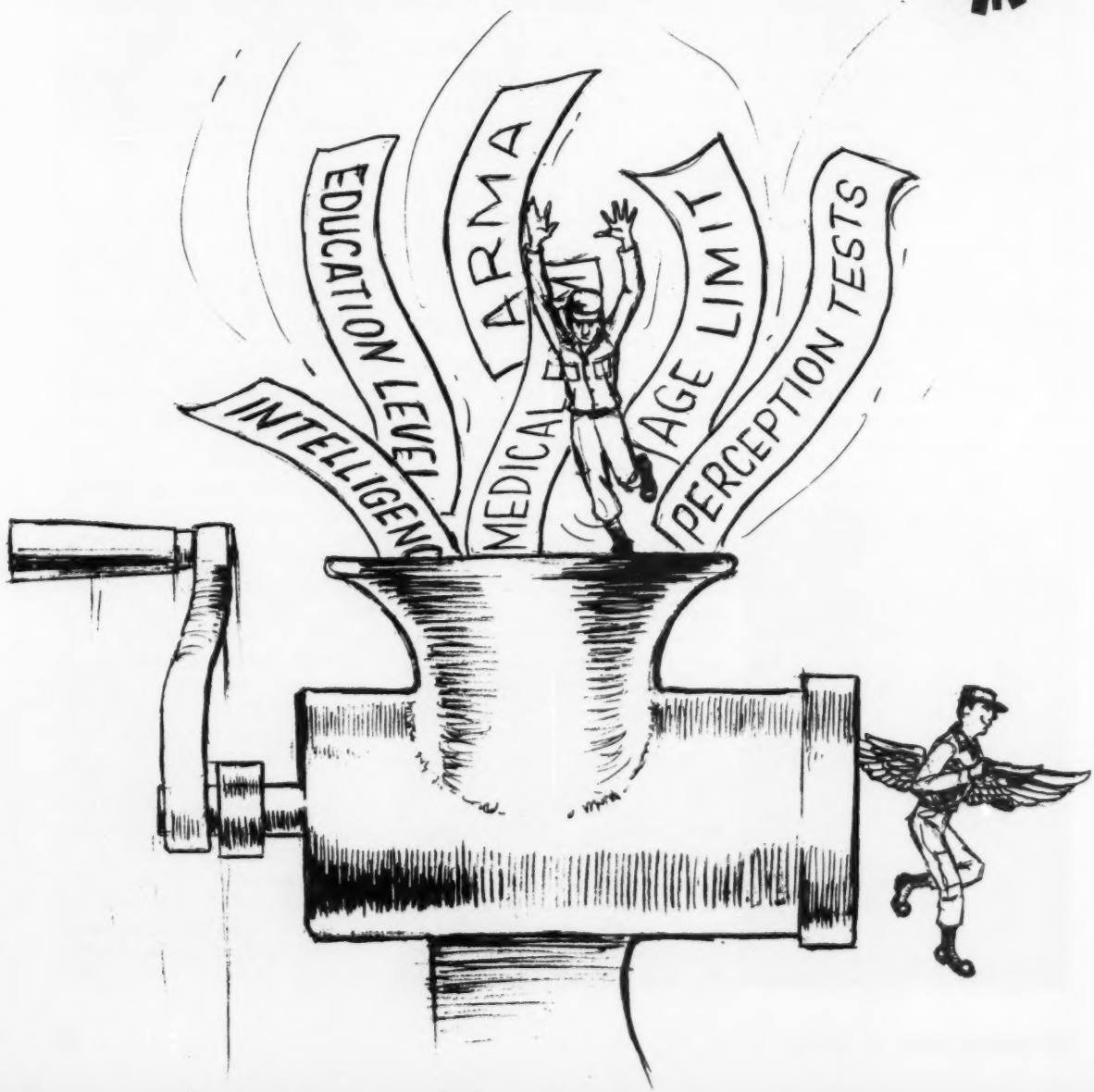
Part IV:

Crew Selection, Training and Coordination

TACTICS outlook

Provided by the Society of U. S. Army Flight Surgeons

Lieutenant Colonel Nicholas E. Barreca, M.D.



AIRCREWMEN flying nap-of-the-earth (NOE) in a high threat air defense environment will be required to have exceptionally keen and resilient physical and psychological capacities. Through decades of aviation experiences there have been many attempts to characterize prospective and successful candidates for flying in terms of psychological and psychomotor (muscular reaction and coordination) skills and natural inclinations.

Whenever aviation missions and aircraft become more sophisticated and demanding, the need for care in selection and placement of aircrewmen becomes more evident. The requirements and prospects of NOE flying again raises controversial questions regarding selection, training and placement of aircrewmen for a variety of flying duties. It becomes an even more pressing question of who *should* fly rather than who can fly. Almost any physically and psychically sound individual can fly given the right instructor, aircraft and conditions (popularly known as "any monkey can fly"). The question is who will have the coordination, maturity of judgment and perception to fly in the demanding environment of NOE?

Due to the complexity, risk and expense of nap-of-the-earth initial and proficiency flight training, alternatives to present methods of instruction must be considered. *Simulation* may be the password to the future for sophisticated, high intensity instruction and practice. In addition, training must become oriented to crews and teamwork both in and out of the cockpit, within and between aircraft. This concept must be adopted and instilled during the earliest stages of flight training and nurtured systematically and progressively throughout an aircrewman's career.

Let's take a closer look at each of these areas of human resources needed to meet the requirements of NOE. The emphasis here is on man, both as an individual and as an essential part of an integrated system.

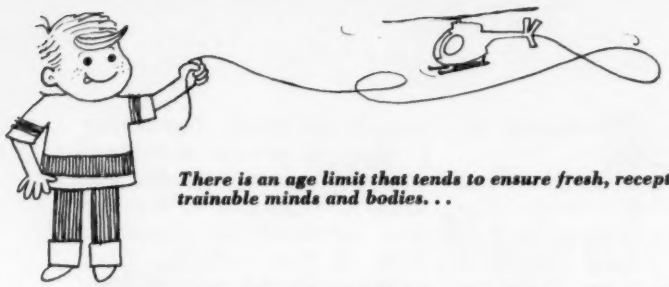
Crew Selection and Placement: Since the early days of aviation many techniques have been used to select predictably successful applicants for flight training. These include intelligence tests, personality inventories, psychological testing, psychomotor performance tests, actual flight testing and selection boards. Together, as a battery of tests and techniques, they were reasonably specific and sensitive, but proved to be rather time consuming and expensive. Many of these techniques have been abandoned in favor of more generalized methods.

Today, Army aviators are selected by a number of techniques which generally increase the likelihood that an applicant will be successful during initial flight training.

- There is an age limit that tends to ensure fresh, receptive, trainable minds and bodies.
- A minimum level of education is required—roughly 2 years of college.
- A battery of intelligence and aviation perception tests are given for which a minimum score must be achieved.
- An initial flying duty medical examination is performed during which a psychological appraisal is performed, known as the Adaptability Rating for Military Aeronautics (ARMA).

Together, these techniques are designed to provide the Army with an individual who is likely to successfully complete a mentally and academically rigorous and physi-

Will the real NOE aviator please stand?



There is an age limit that tends to ensure fresh, receptive, trainable minds and bodies. . .

cally demanding program of flight instruction. True psychological, projective or psychomotor tests are no longer performed or followed prospectively. So no attempt is made to determine the degree to which the selection process has been successful or to characterize different categories or different degrees of flying skill.

Today, perhaps more than ever before, the selection process needs to be accurate and predictive. One of the more sensitive determinants, the ARMA of the flight physical, must be performed systematically and completely. This holds true even in the face of physician shortages—particularly flight surgeons who must be used for many medical tasks besides those supporting flight programs and operations. A reasonably complete ARMA or psychological profile takes 20 to 30 minutes of uninterrupted time to accomplish. The flight surgeon should not be called upon to accomplish an entire flight physical in that period of time. For example, mass screening examinations of potential flight candidates should not be compressed into limited timeframes that constrain the depth of the examination and tend to make it cursory. It should be emphasized that these initial examinations (both class 1 and 1A) are the very examinations that will determine the individual's selection for flight training. This includes the exploratory ROTC flight training program. Subsequent periodic flight physicals do not require an ARMA and usually will occur after an investment in flight training already has been made.

As it stands now, it is expected that every graduate of the Army's flight training program will be able to perform duties in any aircraft in the Army inventory, rotary or fixed wing, and in any mission profile. This may very well turn out to be a realistic expectation, but then it may not. Controversy always has existed about the existence of type personalities for given aircraft and missions. Some personalities are better adapted to the role of the proverbial "cargo" pilot . . . others the roles of "fighter" or "bomber" or "scout" pilots. The potential for these distinctions also exists in Army aviation. There are utility aircraft, medium and heavy cargo aircraft, and assault aircraft. Each relates to specialized missions with varying challenges and risks. There are differences between contact and instrument flying, between day and night flying, and between fixed and rotary wing flying. Most flight surgeons have observed that certain personality types gravitate to gunship operations, others to hauling cargo, the majority to operating utility aircraft. Some enjoy variety, others do not.

Regardless of other factors, there is a good deal of self-selection that goes into where an aviator decides to fly. Most aviators eventually "jockey" themselves into the aircraft and missions in which they feel most comfortable. This may upset certain personnel types but it is probably very true. Is self-selection going to be adequate to determine those who will be able to accept the demands of NOE flight? This is largely an unknown factor to date, but perhaps one that bears investigation. Can psychological and psychomotor tests help in the placement process? Perhaps our human resources organizations could investigate. They certainly believe that instructor pilots, at least, require predictability in their selection.

The next question that is certainly pressing for more prompt and detailed analyses pertains to day versus night operations. There are definitely differences in perceptual ability at night. Each person has differing degrees of physiological and psychological abilities to perform at night. Some are "night owls." They come alive after dark. Others function best during the day. Are these characteristics predictable? Regardless, a unit probably cannot mix both day and night missions in back-to-back proximity or without special preparation.

First, there are the different visual cues and spatial determinants with which to cope. Then there's the lack of detail, the silhouettes that determine recognition of targets and objects. This will take special training and practice even with night vision goggles. More importantly, there is the biological clock to consider . . . circadian diurnal rhythms. Once a given rhythm is established, it is not disrupted without cost in skill fatigue, judgment and alertness. Once a man works all day, he will not consistently work part of the night as well.

Thus, it is likely that units will have to be selected, trained and detailed to operate at night. Certainly such a possibility requires investigation, analyses and testing.

Training for NOE: Courses already are under development at the Army's flight training base at Fort Rucker, AL, as well as in other commands in accordance with the guidelines of TC 1-15 (Nap-of-the-Earth Flight Training). Even more elaborate and extensive courses are anticipated for the future. Currently, the U. S.

Army Aviation Center at Fort Rucker is reviewing TC 1-15, with the intention of expanding its coverage into unit NOE training areas. Also, the Aviation Center is preparing TC 1-( ), Rotary Wing Night Flight, which is designed to teach terrain-type flying at night.

High densities of aircraft will be engaged in various levels and types of NOE initial training and proficiency flight. This represents high cost and possibly higher risk. Can this be avoided? Can some of our NOE techniques be developed in other ways? It would certainly relieve the burden on air traffic control, instructor pilots and aircraft maintenance.

Simulation may be seemingly in its infancy for NOE, but its application is potentially just around the corner. Very soon sufficiently developed visual displays will be integrated with flight controls to almost perfectly simulate actual flight. Computer data from cartography will ultimately permit the display of terrain anywhere in the world, projected along any course one cares to choose between any two points. Combine this with varying lighting conditions day or night . . . also computer determined . . . and you have an infinite number of problems to challenge aviators both in initial training and later at operational training bases.

With simulation of this type, medical aspects of vision and orientation can be experienced firsthand and without risk. With complete cartographic data, a pilot could simulate an actual mission over enemy terrain before it is actually flown. Computers might have to do some guessing or filling in such as the enhancement of the National Aeronautics and Space Administration (NASA) photographs of our heavenly bodies, but it will certainly be better than no foreknowledge at all.

Perhaps this can only be looked upon as visionary, but investigation along such lines will likely be productive. It might even permit more realistic night vision and goggle training.

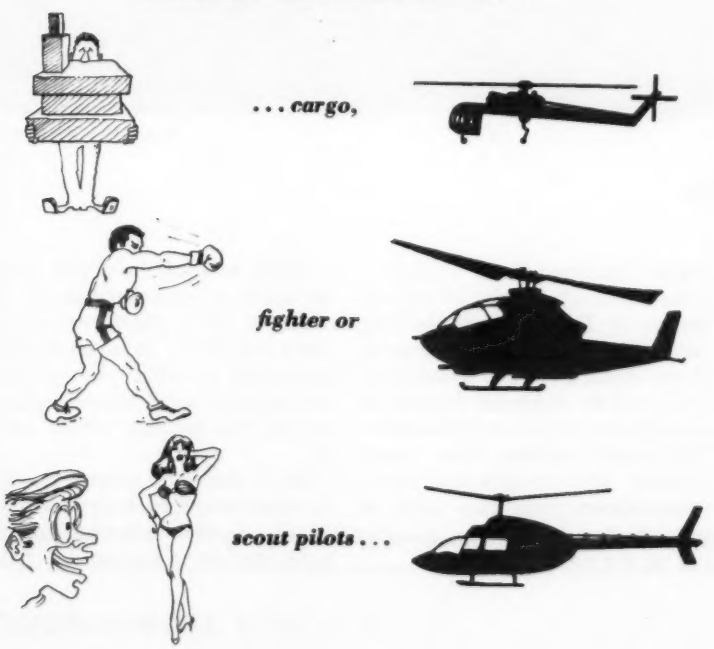
Crew Coordination: Past flight training programs have been designed mostly to train individual aviators who can confidently handle an aircraft singlehandedly. Have systematic and consistent attempts been made to develop crew coordination and teamwork, though? This is invariably left to unit training where it is seldom given scientific credibility.

NOE requires crew coordination and teamwork to the highest degree. Crew coordination and teamwork requires mutual confidence, respect and trust. This seldom comes from flying with a different individual every day, but frequently develops when stick buddies are adopted. Can complementary crews be predicted? Probably so and, if reliable, perhaps groups of compatible and complementary crews can be determined at each unit. This would be similar to computer dating. Perhaps the same computer that does the NOE simulation also will marry up the crews by virtue of the capabilities and limitations determined as an ongoing process.

Again, this might be looking far beyond the depth of today's crystal ball, but it uncovers some elements that bear investigation. What are the principles of teamwork and coordination? Are they being systematically taught and nurtured? Are they an integral part of today's training programs or are they expected to develop by chance? NOE appears to be the stimulus that demands purpose and planning. To this end, Army aviation must attend itself.

Aeromedical factors will likely be the critical determinants of successful NOE missions. It behooves all of us to systematically and continuously examine our capabilities and limitations, taking all pains to scientifically establish the criteria and procedures that will maximize performance and ensure mission effectiveness. There are things that develop and grow without planning, purpose and great care—but unfortunately these are akin to weeds.

Some personalities are better adapted to . . .



HLZs

PLAN THEM WITH INTELLIGENCE

Lieutenant Phillip R. Stewart
101st Airborne Division (Airmobile)

Photo by SP4 Bill Swartz

"THE SMOOTHEST airmobile operation I've seen in 16½ years. Its effectiveness was due to aviation planning. The infantry unit and aviation element must plan an airmobile assault together." These were the words of Lieutenant Colonel Warne D. Mead, commander of the 1/502 Infantry Battalion, 2d Brigade, 101st Airborne Division (Airmobile), after his battalion successfully completed a night combat airmobile assault on 27 March 1974.

Success on this particular airmobile assault was due to the planning coordination of Major John R. Mills of the 158th Aviation Battalion and Captains John Daane and Nick O'Dawe, S3 Air and S2, respectively, of the 1/502 Infantry Battalion.

Because the infantry, airborne and airmobile divisions all possess an organic airlift capability, it is particularly imperative for night air assault operations that commanders receive accurate and specific information concerning possible helicopter landing zones (HLZs). Data necessary for the proper selection of HLZs include landing zone dimensions, percent ground slope, obstacles in and around the HLZ and the estimated number of aircraft that can be accommodated. This article outlines some Army aviation safety factors and photo interpretation techniques used to provide that information for the use of the commander.

When selecting helicopter landing zones, maximum use should be made of all available reconnaissance resources. Maps can be supplemented by aerial photography, ground and aerial reconnaissance reports and engineer terrain studies.

HLZs should be selected that are on fairly level terrain, in proximity to the objective and with a minimum number of natural and man-

made obstacles within their boundaries. Alternate as well as primary landing zones should be preplanned because a change of tactical situation could make primary HLZs inaccessible. Possible HLZs may be mined or heavily defended by enemy antiaircraft guns which may not be detected until friendly aircraft are well along their flight routes. This situation would necessitate a change of HLZ.

Initially, possible HLZs should be selected by the S3 and S2 from map coverage, with detailed evaluation of the terrain by the S2 to support the planned assault. The planner should not rely entirely on map coverage of an area when other sources exist because terrain features may be changed by man or weather conditions. Recent aerial photography of the area of interest can be an excellent map supplement, whether flown by the Army's OV-1 Mohawk or U. S. Air Force reconnaissance aircraft.

When aerial photography of the area exists, the image interpretation section of the military intelligence company at division can provide the S2 with HLZ ground slope, landing zone dimensions, obstacles in and around the landing zone and the approximate number of aircraft the landing zone can accommodate.

LT Stewart is now the Assistant G2 Air, 101st Airborne Division (Airmobile). He is a graduate of the Intelligence Officers Basic Course, Aerial Surveillance and Reconnaissance Course, Intelligence Officers Course and the Airborne School

In the absence of image interpretation support, the unit S2 can develop the needed data using the following techniques:

In the initial selection of HLZs, ground slope is a major factor in determining whether a possible landing zone can be used. Ground slope of 7 to 15 percent is marginal and if ground slope exceeds 15 percent helicopters cannot land safely. Ground slope is determined from map coverage using the horizontal distance (HD) of the long axis of the landing zone. Vertical distance (VD) is determined by subtracting the lower elevation point on the HLZ from the highest. In figure 1 ground slope was determined to be 5 percent, so the landing zone will be acceptable if large enough to accommodate rotary wing aircraft.

Physical landing zone dimensions can best be determined from aerial photography. Ground distance of landing zone lengths and widths can be determined by using a combination of distance and scale of photography.

EXAMPLE: GD = Ground Distance

Figure 1

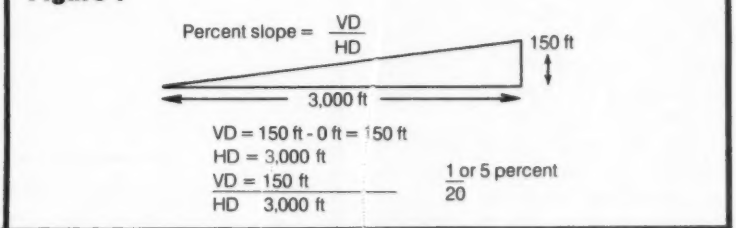
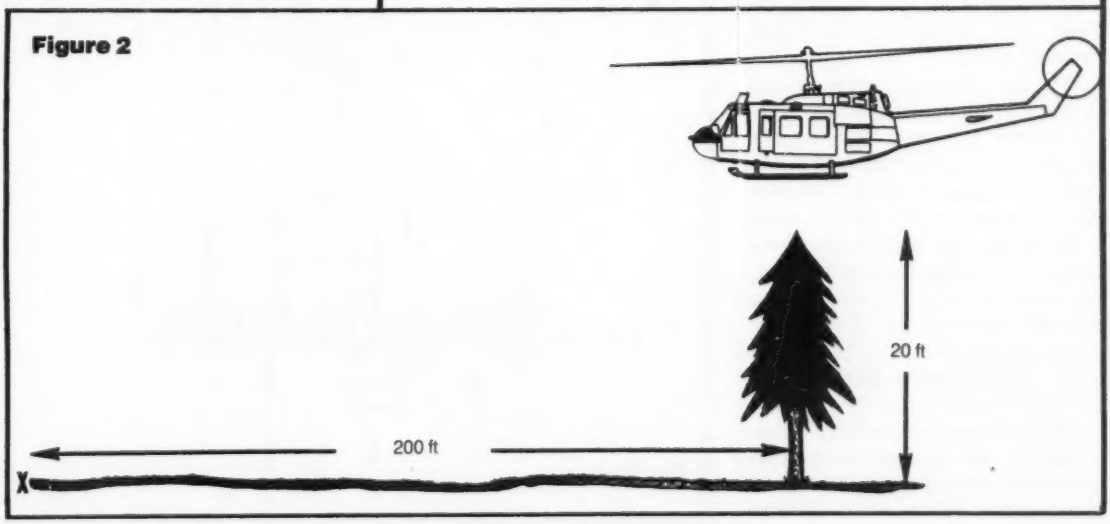


Figure 2



PD = Photo Distance
PS = Photo Scale

GD = PD x PS

Photo Distance of the HLZs length measures .026 feet

Photo Scale is 1:8,800

GD = .026 feet x 8800

GD = 228.8 feet

The mathematical formula above is used with aerial vertical photography. When photography of the area of interest is not available, ground reconnaissance reports and map measurements may be the only other method to determine HLZ dimensions. Visual reconnaissance may be precluded by the tactical situation or possible LZ compromise.

After HLZ dimensions have been determined, direction of aircraft approach should be planned.

The best approach for rotary wing aircraft is generally into the wind. When there is only one satisfactory approach due to the tactical situation or obstacles, most aircraft can land with a crosswind of less than 10 knots or a tailwind of less than 5 knots.

For determination of direction of approach, wind information such as prevailing winds or a wind/weather forecast can be obtained from the attached Air Force weather element.

If, for example, direction of approach has been determined to be toward the north, the next step would be to determine what obstacles are present along the southern boundary of the landing zone.

Trees, grasses, high-tension wires and other manmade features can be obstacles to landing rotary wing aircraft. For every 1 foot of obstacle height the helicopter must have 10 feet beyond that obstacle to land (figure 2).

When large-scale aerial photography of the area of interest is available, obstacle heights can be determined. When such photog-

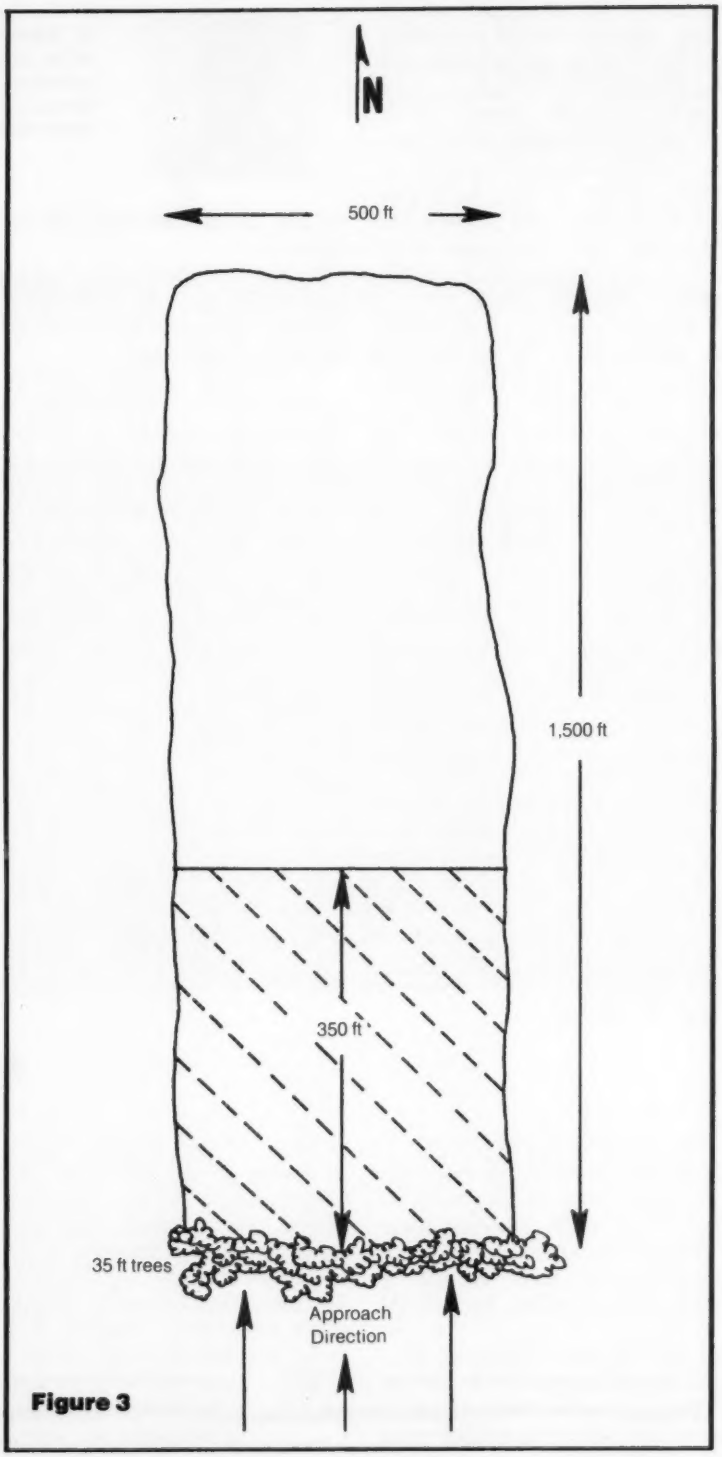


Figure 3

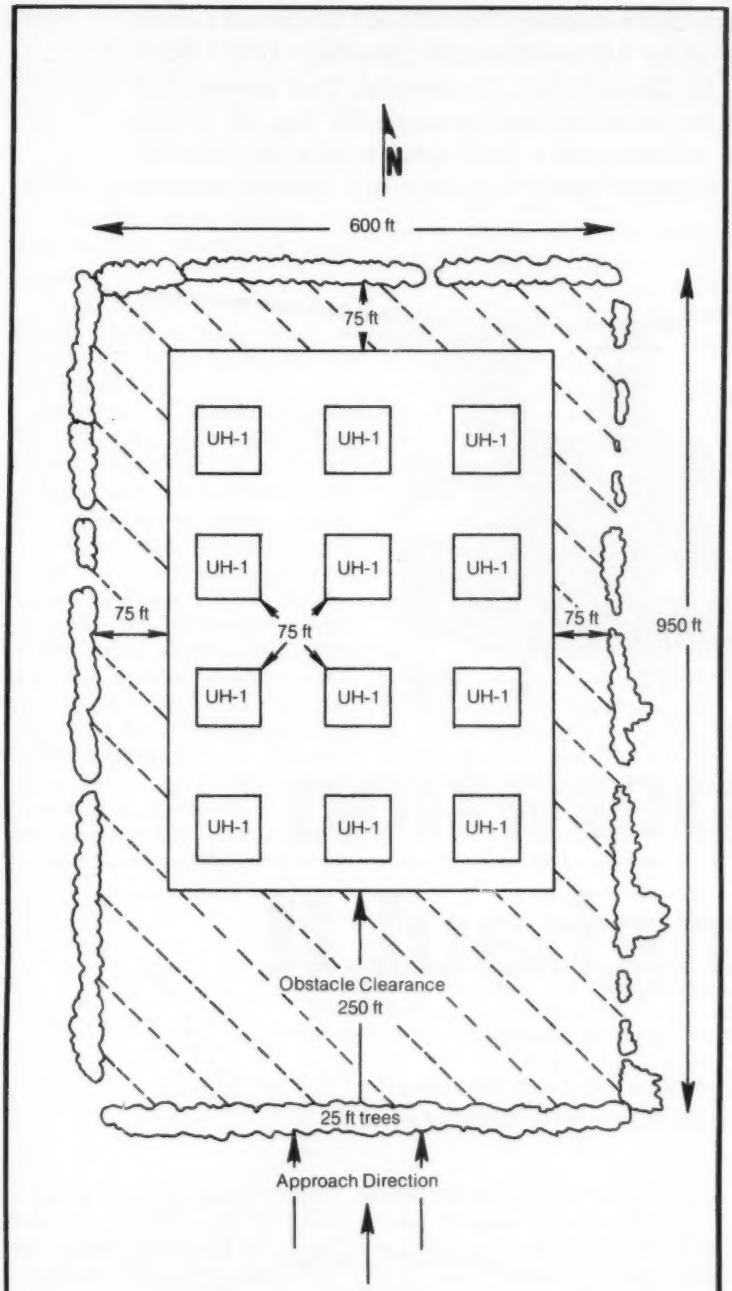


Figure 4

raphy is not available, other sources such as ground reconnaissance reports and engineer terrain studies may be used to estimate obstacle heights.

Obstacles present around the HLZ from the direction of approach may seriously affect the usable portion of the landing zone (figure 3).

In addition to obstacles surrounding the HLZ, obstacles on the HLZ may affect its usable area. Trees and depressions are examples of obstacles within an HLZ that must be accounted for and can seriously affect the landing capacity. Once the total usable area within an HLZ has been determined, landing zone aircraft capacity can be determined.

The number of troop and supply bearing aircraft that a particular HLZ can accommodate can be a crucial determination when planning airmobile operations. During airmobile assaults, a UH-1 Huey requires a landing area 80 feet square and a CH-47 Chinook requires an area 100 feet square. Additionally, a 75-foot safety distance should be maintained between aircraft and other obstacles on and surrounding the HLZ (figure 4).

For night combat assaults the safety distance between aircraft should normally be at least 35 meters. When slingloading artillery at night, 50 meters should be maintained between each CH-47.

Landing areas and safety distances for night operations can be the same as for daylight operations but will normally be left to the discretion of the aviation unit commander.

Whether an airmobile assault is planned for day or night, the use of all available reconnaissance resources and coordinated intelligence, operations and aviation planning will greatly aid in the completion of a safe, successful airmobile operation.

The 159th prepares to deploy five CH-47 Chinooks on a 5,040 nautical mile trans-Atlantic journey from Fort Campbell, KY, to Mannheim, Germany. The proposed 15 day operation includes an overwater leg of 1,065 miles and the helicopters will gross out at 50,000 pounds, 4,000 pounds above maximum gross weight

TACTICS TRAINING outlook

operation longhaul II

Major Bill Gram
and
Captain Benjamin Vandervoort
101st Airborne Division (Airmobile)

THE 159th AVIATION Battalion, under the command of Lieutenant Colonel Donald E. Holroyd, 101st Airborne Division (Airmobile), Fort Campbell, KY, has proven the feasibility of self-deployment of the CH-47 Chinook helicopter. On 26 September 1973 four aircraft from the unit flew nonstop from Homestead Air Force Base, FL, to San Juan, Puerto Rico —a total of 907 nautical miles. Four days later they departed San Juan and flew back. This completed Operation Longhaul I (see "Operation Longhaul," February 1974 DIGEST) and set the stage for Longhaul II which is currently in the planning stages.

Longhaul II will be a trans-Atlantic flight to Europe to test the ability of the Chinook to self-deploy to the European theater. Originally the 159th had planned to ferry aircraft slated for use by a European command from the United States to Germany. However, the issue is still debatable and under consideration.

The objectives of the mission

remain unchanged:

- Provide a data base for strategic self-deployment of Army aircraft from the continental United States (CONUS) to Europe.
- Establish a data base for the self-deployment of the Chinook.
- Test the effects of extended flight on the CH-47s and crewmembers.
- Study the feasibility of upgrading the alternate gross weight of the CH-47C from 46,000 to 50,000 pounds.

Planning and coordination for the expected trans-Atlantic flight began in December 1973. Routes of flight have been identified and the one which seems most suitable for the mission is from the United States to Newfoundland, then across the Atlantic Ocean to Portugal with two intermediate stops in the Azores Islands. This route provides optimum weather conditions on an annual basis and is not dependent on a floating refueling station. However, an alternate route also is under consideration. It would be similar to the route used by crews who ferried bombers to England during World War II.

To fly the longest leg of the mission it will be necessary for the CH-47 to take off at an alternate gross weight of 50,000 pounds. More than half of this weight is fuel. To carry this extra fuel a system of incorporating five 600 gallon ferry tanks was developed. To fly the aircraft 4,000 pounds over its maximum gross weight a safety of flight release for the trip must be obtained from the U. S. Army Aviation Systems Command (AVSCOM).

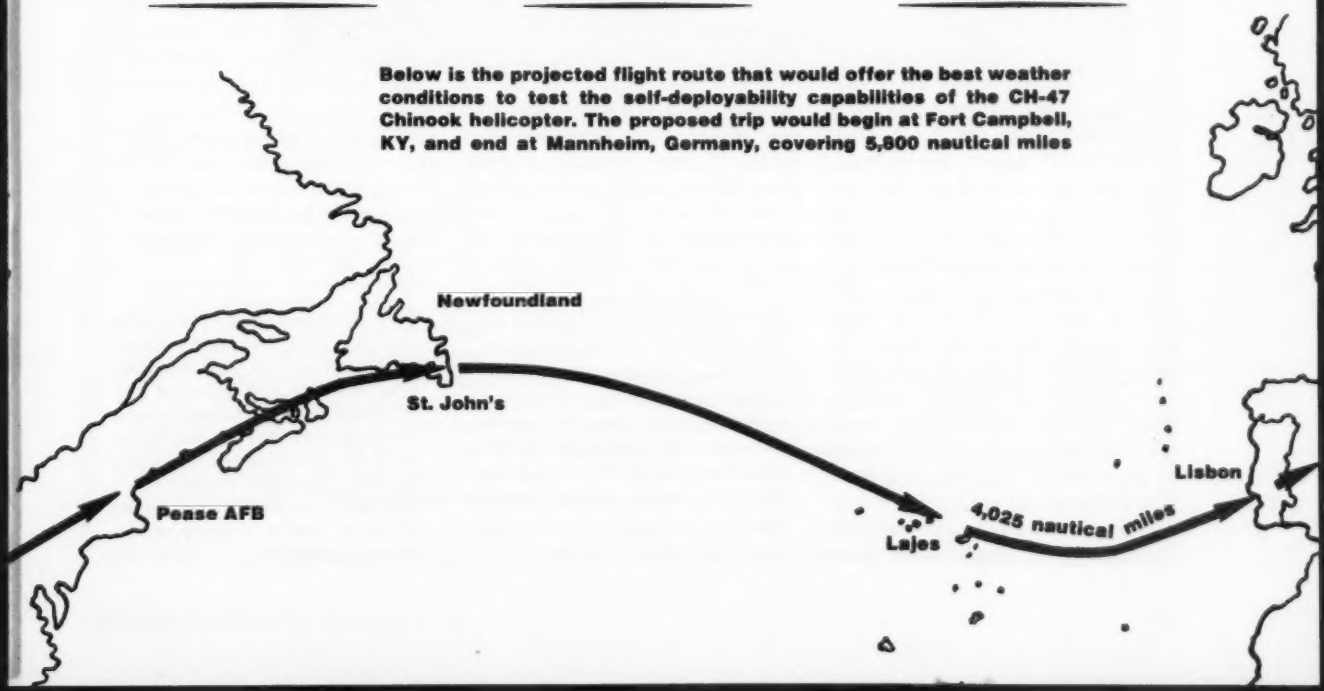
There is no doubt about the ability of the Chinook to fly at this weight. On 31 January 1974 at 0800 hours a CH-47C with L-11A engines took off from Fort Campbell. The aircraft was piloted by Captain Ben Vandervoort and Chief Warrant Officers Billy Stafford, Bill Pepin, and Bud Saunders. They returned to Fort Campbell 9 hours and 5 minutes later after flying a roundrobin flight around the Tallahassee, FL, area and back to Fort Campbell—a total of 1,090 nautical miles. The Chinook still had 1,750 pounds (40 minutes) of fuel remaining.

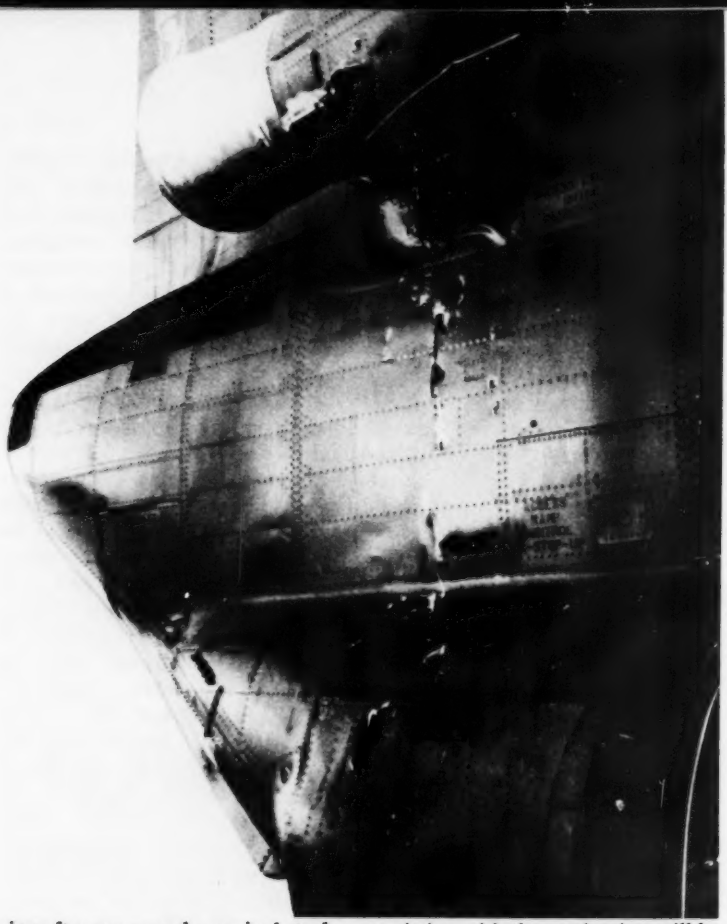
No oil was needed in flight. A consumption check revealed no oil used by either of the two engines. Oil analysis of all engines and transmissions proved negative. The aircraft flew smoothly throughout the entire flight with only one minor hitch, that being the sensitivity of the thrust control rod when the aircraft was hovered at takeoff weight.

One of the major delays anticipated concerns the use of foreign territory for refueling operations. Another delay which was not foreseen is the recent difficulty with the L-11A engine. The trouble concerns a third-stage turbine wheel. Recently on an IFR flight an L-11A engine failed when the turbine wheel disintegrated. Longhaul II will not be attempted until this problem has been completely solved and remedied. The engines have since been repaired and the 159th again is flying the aircraft.

Primary concern during the entire mission will be with safety. Procedures for every imaginable emergency are being established. The most emphasis is on procedures for conditions not normally encountered. These include water landing with partial power at high gross weight, recovery of downed

Below is the projected flight route that would offer the best weather conditions to test the self-deployability capabilities of the CH-47 Chinook helicopter. The proposed trip would begin at Fort Campbell, KY, and end at Mannheim, Germany, covering 5,800 nautical miles





This damage to the Super C series CH-47 occurred when the turbine wheel disintegrated on the L-11A engines during a flight. The pilots, CW4 Bill Pepin and CW3 Gary Baginski, received the Army's Broken Wing Award for preventing further damage to the Chinook helicopter by making a good emergency landing

aircraft crews and survival techniques in cold water.

Assuming the mission is approved this is the route the flight will follow:

On the first day we will fly the five aircraft 850 nautical miles to Pease Air Force Base, NH. There we'll spend one day effecting final coordination with the U. S. Air Force C-130 escort (Duckbutt) and pull maintenance on the aircraft. On the third day we'll fly 830 nautical miles from Pease AFB to St. Johns in Newfoundland. Here we will perform final maintenance checks prior to the next and longest leg of the flight. A three-day stay is planned including one day for a possible weather hold. On the seventh day we'll take off enroute to Flores Island in the Azores. Duckbutt will provide navigational assistance and is equipped to assist any aircraft which might be forced down. Also assisting with the navigation will be two LORAN (long range navigation) units on two of our Chinooks. Additionally, two of the aircraft will be equipped to effect a sea rescue should the need arise.

The leg from Newfoundland to Flores is the longest leg of the mission—1,065 nautical miles over open water. The anticipated flight time is 7 hours and 56 minutes. Upon landing in Flores the aircraft will be refueled and the crews will spend the night. The following day we will fly 200 nautical miles to Lajes Island and spend another day there to prepare for the last overwater leg of the flight.

On the tenth day we will fly 850 nautical miles to Lisbon, Portugal. Here we will pull an intermediate inspection on the aircraft and spend three days for crew rest (don't laugh—at that point we'll need it!). On the fourteenth day we will fly 425 nautical miles to Zaragoza, Spain. On the fifteenth day we will fly the last leg of the flight, 820 nautical miles to Mannheim, Germany, a total of 5,040 nautical miles for the entire trip. At Mannheim the aircraft will be delivered to the Army depot for further deployment in the European theater—providing they are aircraft supplied for their use. Otherwise we will turn around and make the flight back with our own aircraft.

If the need should arise during a period of national emergency the flight could be accomplished in six days.

There are many problems yet to be resolved before our flight to Europe can be accomplished. But the men of the 159th Aviation Battalion are confident that they can "press on."

MAJ Gram is commander of Company C, 159th Aviation Battalion, 101st Airborne Division (Airmobile). He is the assistant flight commander in planning for Longhaul II. He has about 1,750 flight hours in CH-47 aircraft and has spent time as an instructor pilot for CH-47 transition training

CPT Vandervoort is safety officer for the 159th Aviation Battalion at Fort Campbell. He has nearly 2,300 hours of CH-47 flight time. He formerly was a warrant officer having flown with the 101st in the Republic of Vietnam. CPT Vandervoort has flown in Alaska and spent a year as a rotary wing instructor pilot

ARMY AVIATION HALL OF FAME

Frank N. Piasecki

FRANK N. PIASECKI received a B.S. degree in Aeronautical Engineering from New York University in 1940. His interest in rotary wing aircraft led to his first helicopter flight in 1943. Subsequently, his efforts were directed toward the development of tandem rotor cargo helicopters; the first such, a prototype of the CH-21, flew in 1945. In the late 1940s and early 1950s, Army aviation first felt Mr. Piasecki's influence when the tandem rotor H-25 and CH-21 entered the Army fleet. The CH-21 became the Army's standard lift ship and was used extensively in that role during combat in the early years of United States involvement in the Republic of Vietnam. Through his development of tandem rotor cargo helicopters, Mr. Piasecki was largely responsible for the Army's first capability to form airmobile combat forces and to provide responsive and reliable airmobile logistical support for those forces. The current CH-47 Chinook and ongoing development of heavy lift helicopters (HLHs) evolved from Mr. Piasecki's pioneering efforts. Mr. Piasecki continues to influence Army aviation as president of Piasecki Aircraft Corporation.

Arnold R. Lambert
Publications and Graphics Division
U. S. Army Agency for Aviation Safety

PROFESSIONALISM TOO LATE

WHEN A PATIENT is being considered for major surgery, when should those on the surgical team start showing professionalism? Should they wait until they start to stitch the incision and try to make sure the patient isn't left with an unsightly scar that can't be covered by her bikini? Or should they start when the incision is made? Should the surgeon be the only one who knows what has to be done? It's obvious that professionalism must start long before the patient is wheeled into the operating room and each team member must know what his or her duties will be.

The surgeon must know whether the patient is physically strong enough to withstand the operation and the probable consequences if the surgery is delayed. He must know the step-by-step surgical procedures and alternate procedures for any emergency that could arise.

As you can see, good judgment and professionalism must begin with the planning phase and continue until the patient has completely recovered. The same rule applies to every profession and is especially important in aviation. Here is an account of an Army aircraft accident which occurred because professionalism came too late.

The pilot in command received the ferry pilot briefing from the division aircraft configuration noncommissioned officer (NCO), but did not receive a U. S. Army Aviation Systems Command (AVSCOM) ferry packet. He was briefed on recommended routes and applicable rules pertaining to IFR (instrument flight rules), night and weekend flights per a unit regulation. No other crewmember attended the briefings. The crew departed home base in a UH-1H and arrived at their destination the next day. After resting for two days, they prepared to ferry a UH-1H back to home base.

They inventoried the aircraft and preflighted it. During a 30-minute test flight, they made a ground and air check of the ADF (automatic direction finder) and VOR (very high frequency omnidirectional range) equipment. These systems checked out okay.

The pilot filed an IFR flight plan and received his weather briefing. He determined his true airspeed to be 84 knots, total distance to facility serving the destination as 129 nautical miles and estimated time en route as 1 hour and 30 minutes. His weather briefing listed the winds at his selected altitude as 250 degrees at 25 knots. An alternate airfield was required, based on forecast destination weather, but he did not file for an alternate.

The aircraft log book had a circle red X condition for an unreliable fuel gauge, restricting this aircraft to 2 hours flight. Based on the pilot's experience as a maintenance officer and his observations during the 30-minute test flight, he listed 2 hours and 30 minutes of fuel on board the aircraft. The weather briefer advised against departing that day because of the weather system that was moving from west to east. He told the pilot that the weather would worsen within an hour after his ETA (estimated time of arrival), but the pilot elected to go ahead with the flight.

When he arrived back at the aircraft it had not been refueled. The crew flagged down a passing fuel truck and topped off their fuel tank with 52 gallons of JP4. They departed the airfield at 1534Z, after 10 to 15 minutes ground runup and hovering for departure. Their entire flight was conducted under IFR conditions soon after departure.

After departing they were dropped from radar and advised to contact destination at intersection A. The pilot reported intersection A to destination tower who directed them to hold at intersection B at 1736Z. The crew reported holding at intersection B at 1736Z. Sometime shortly before or just after they reached intersection B, the winds increased to about 40 knots. The crew never did become aware of this problem. They thought they were having a VOR problem because they did not receive station passage indication in the proper time frame based on their estimated ground speed of 60 knots. They never physically made a ground speed check. The destination con-

troller at that point computed their ground speed at 36 to 37 knots but didn't question the crew because he knew very little about helicopters and thought it might be normal.

At 1750Z the aircraft was cleared to destination VOR and was instructed to hold there. Shortly after entering holding, the 20-minute fuel warning light came on. The crew did not believe the warning light with the fuel gauge indicating 470 pounds of fuel, even though the unreliable fuel gauge was written up. The crew did not report this condition to the tower. The pilot reported departing intersection B at 1756Z and asked the tower how long he would have to hold. They told him it would be only a few minutes.

At 1810Z the pilot told the tower that he only had 20 minutes of fuel left on board and requested a DF (direction finder) steer to the airfield. The tower advised them of the terrain elevation in their area and gave them a DF steer to the airfield, a direction of 320 degrees. The pilot received permission to descend and find a place to set the aircraft down. At terrain altitude (1,400 feet indicated) the aircraft was still IFR but the crew could occasionally see treetops directly below them. At 1820Z the engine quit and the pilot zeroed his airspeed and cushioned the aircraft into the treetops. The aircraft came to rest on its right side, basically intact. The crew got out of the aircraft without help and notified authorities.

FINDINGS

- The pilot elected to file IFR in violation of AVSCOM ferry rules and a local regulation which prohibited IFR flight on the first leg of a ferry flight. The pilot was aware of this restriction but was not issued an AVSCOM ferry packet. The restriction was covered in a briefing prior to departing on the ferry flight. The reason for this error can be attributed to the absence of all other crewmembers at the briefing and the fact that the pilot did not adhere to published regulations.
- Only the pilot attended the weather briefing and he alone planned the IFR flight. This resulted in a computation error of time en route (should have been 2 hours plus 12 minutes) and lack of selection of an alternate airfield which was required (by AR 95-5, par. 4-23b) because of forecast destination weather. The reason for this can be attributed to the pilot's haste to beat the worsening weather forecast for his destination and a lack of understanding of the requirement for an alternate airfield.
- The crew disregarded a circle red X condition for an unreliable fuel gauge which restricted the aircraft to 2 hours flight duration. The pilot figured his reserve of 45 minutes as part of the 2 hours and 30 minutes fuel when in fact his reserve should have been part of 2 hours fuel. This would have restricted his flight to 1 hour and 15 minutes which had to include flying time and approach to an alternate airfield. Based on this, the flight should not have left the airfield. The reason for this error can be attributed to the pilot's interpretation of the fuel gauge reliability based on his experience as a maintenance officer and a short 30-minute test flight.
- The crew did not recognize the problem of increased headwinds and the resultant decrease in ground speed which lengthened their en route time. They focused too much attention on a suspected faulty VOR and ignored the low fuel state.
- The crew exercised poor judgment in not declaring an emergency to expedite their landing when their fuel supply reached a critical point or when they believed their navigation equipment to be faulty. At no time did they report suspected faulty navigation equipment. The only indication they gave the controller of a fuel problem was to report 20 minutes of fuel remaining at 1810Z. The engine quit at 1820Z. The reason for this error in judgment can only be explained by the crew's unwillingness to admit to the controller that they were in trouble.
- Supervisory error is a suspected factor in this accident because the clearing authority made only a cursory inspection of the flight plan. A more thorough check of the flight plan with the weather briefing form attached would have pointed out the computation error in time en route and, more obviously, the need for an alternate.

Extremely poor judgment was used long before the crew ever departed and continued until the crash became inevitable. The accident report stated: "The crew at this point (crash was inevitable) did show a sense of professionalism in that they knew what was about to happen and prepared themselves for it. The actual autorotation, when no landing area could be found, was done with near zero airspeed and cushioned into the trees." This sounds like a nice way of saying the crew finally did something right.

take a minute for aviation safety

Adapted from an article by Captain Vernon L. McLinn, USMCR, in SAFETY RAISER

A PROBLEM OF ATTITUDE

REMEMBER THE TERMS perception and threshold from human relations training? Stated simply, the concept says that in order for anything to be noticed, it must first be considered significant enough to warrant noticing. This is also called sensitivity and it applies to everything that touches our lives. The person to whom all trees look alike is insensitive to a natural environment. By the same token, he may be able to hear the slightest flaw in the sound of an automobile engine. Sensitivity in this sense is a very individual thing and is developed early in life. The mechanic mentioned above may have been raised in a city where trees were a rare occurrence and fast cars were considered important. All that is required for him to begin noticing trees is for him to reach a decision, either consciously or subconsciously, that a natural environment does have a few things, such as peace and quiet, to contribute to his well-being. Through individual effort, we can exercise some control over sensitivity, especially when our physical and mental well-being is considered.

Our behavior, the way we are, is determined by what we perceive and our sensitivity serves as a filter for what enters our minds. To this extent, sensitivity affects our behavior. We notice things for which we have strong feelings, either likes or dislikes, but could care less about other things because of their seeming insignificance. The extent to which we are able to notice another person's feelings and our preferences for classical, folk, country or rock music are categories of sensitivity.

Just as everyone is interested in something, there are things that don't really seem to interest the average person. There are not many stamp collectors around and bird watching isn't usually considered a worthwhile hobby except by its enthusiasts. Although it receives a lot of lip service and the term is freely bandied about in conversation, safety appears to be one of these areas of little real sensitivity. A person can be told to be safe and reprimanded for doing something unsafe, but unless he has a genuine desire in being safe, all the posters, movies and catchy slogans will not make him safe.

Many people confuse safety consciousness with industrial safety. Unlike coveralls and industrial safety, a real safety consciousness cannot be left at work. It is for this reason that real safety must be considered an individual attitude, present in some degree in all of us and governed by our sensitivity towards hazardous situations everywhere.

The ability to recognize the existence of danger in everything we do is one of the many areas of sensitivity in need of widespread improvement. This change in attitude cannot be done to the extent necessary with the posters and rules of industrial safety. It is a basic attitude that must be cultivated in the consciousness of each of us just as awareness of our environment is being increased by all the various shortages our previous insensitivity is now causing.

The greatest need of improvement is not in the area of industrial safety, but in our attitudes towards safety at home, on the road, on vacation, places where the individual is on his own. These are the places a person must be actively interested in making safe. The defensive driving campaign was an attempt to awaken the safety consciousness of individuals. It worked for some but not for the tens of thousands of individuals we kill or injure each year simply by failing to realize the inherent dangers involved in the operation of an automobile.

The next time you take an inventory of your mind, check to see if you are really safety conscious or simply fooling yourself. If you really are safety conscious, it will reflect in everything you do. If not, then the posters are correct. The next life may be your own.

getting things done through

William D. C. Jones
Headquarters, U. S. Army Forces Command

A PROBLEM THAT seems to bug most supervisors is the continued one of monthly aviation safety meetings for aviators. In the past, these meetings have been thinly disguised as staff conferences, officers' calls, or even safety council meetings in order to get people to attend. No matter what the meetings are called, they may fall far short of the original intent.

The purpose of the safety meeting can be found in AR 95-5 under "training" and should be aimed at modifying human behavior. Unless we can get an otherwise excellent pilot with a poor attitude concerning risk avoidance to change that attitude for a better and more professional (and therefore safer) one of getting the job done with the minimum amount of risk, we are simply wasting time. Many commanders are not willing to devote an hour a month to a purpose they do not understand and, therefore, do not accept. To "satisfy" the regulation and avoid a "gig" on an inspection, commanders of some aviation units allow safety meetings to be held but do not really lend any support to the meeting itself beyond seeing that proper records of attendance are kept and filed. Frankly, one cannot give much credit to this approach because, at best, it is only lip service.

By interviewing aviation unit commanders, it was learned that their attitudes toward safety meetings could best be summed up as (1) lost time, (2) forty winks and (3) plain boring. Evidently, some improvement in the quality of the meetings is desired.

Unless meetings are short and productive, they should not be held at all. The surest way to kill a safety program is to hold dull safety meetings that bore the aviator to death. The alternative to holding boring meetings is to conduct them in an interesting and informative way which creates enthusiasm and presents safety in a positive sense. Safety meetings then become a management tool for changing the aviator's attitude and, thereby, bring about a reduction in accidents.

better communications

The length of the meeting should be tailored to the topic. Ten minutes should probably do if you are giving a rundown of changes in regulations or aircraft operating procedures, or a pep talk on safe flying. As a general rule, 30 minutes should suffice for safety meetings, with 15 minutes for two or three main points and 15 minutes for discussion. The last 15 minutes of the 30-minute period is the most important part of the meeting. Through discussion, you can tell whether or not you got your points across clearly, and you may be surprised how little meaning your talk imparted. At the same time, you can judge the aviators' reactions to the main points of your presentation, and this should help you in planning future talks to the same audience.

The main points of your talk should be well thought out in advance and put in simple, straightforward language, but should not be dictatorial in any case. The presentation should be matter-of-fact and convincing, but humor and illustration in the beginning will help everyone relax. Communication has been overdone as an idea, but some of the things we have learned recently about communicating are worth a brief review here.

In its simplest form, communication occurs if Joe is talking to Tom when Tom is listening and understands what Joe has said. Two-way communication occurs when Joe stops talking long enough to listen to what Tom has to say and Tom may also talk. If Tom may only listen to Joe, then communication is said to be one-way. But if Tom is allowed to talk freely as well as listen, the communication is said to be two-way. Certain advantages may result in either case, but there are also disadvantages. If we are to make maximum use of our 30-minute monthly aviation safety meetings, we must learn to minimize these disadvantages as much as possible.

One advantage of one-way communication is that Joe talks uninterrupted and, therefore, faster, but Tom is unable to talk or ask questions so he is less sure of Joe's meaning and it is less accurate. The sender, Joe, is psychologically closed to Tom's comments and, therefore, feels more secure and less threatened by them. But he also doesn't know whether what he is saying is getting across so he is unsure of the impact of his meaning on Tom. Tom may make snide remarks in a two-way communication net and get angry at Joe. This may make Joe very uncomfortable but, at least, he will come closer to an understanding of his own mistakes and shortcomings as well as to a knowledge of Tom's needs and opinions on the subject at hand. The two-way method of communicating is much slower than one-way since the slowest man in the group will usually hold up the rest; but the two-way method is more accurate. The two-way method is also more disorderly and noisy. But if Joe wants to get his message across and be sure that he has done so, he will choose the two-way method.

If you are preparing for an upcoming safety class and are trying to decide whether to opt for one-way communication or two-way communication, two-way communication is preferred. This means that ASOs will be well advised to abandon the lecture method of subjective presentation in favor of the preferred conference technique.

During the question and answer period, remember to keep the conversation open and the communication two-way. Make your own answer brief and to the point. When the aviator (Tom) asks a question, listen attentively. You may not have understood the question at all. Try the technique of rephrasing the question in general terms for everyone to hear and then call on another classmember for his version of the answer. If that fails, answer as briefly and clearly as possible and then forge ahead in the interest of time. Never argue a point. Arguing wastes time and your chances of getting Tom to admit he is wrong

in front of his peers are pretty slim. Prefer to merely quote the correct answer to the question and state your willingness to entertain further discussion with Tom after everyone else leaves.

Meetings are real downers for most people and often bring out the worst in some. Meetings produce people who won't talk as well as people who won't quit talking, and people who will agree with anything as well as people who disagree with everything. Here is a list of archetypes and what to do about them.

Silent Sam: Whether timid, insecure, indifferent or bored, Silent Sam won't talk unless you force him. Handle Sam by asking questions directly addressed to him. Ask his opinion, compliment him when he answers and tell him you appreciate his participation and interest.

Chatty Charles: Quick to respond to any question, Chuck will always rush to the forefront with his opinion, frequently trodding on the open mouths of his associates in doing so. Handle him tactfully by questioning others and suggesting "we give others a chance to express themselves." Do not offend old Chuck because you can use him when others fail.

Hard-headed Henry: Second cousin to Obstinate Oscar, Henry couldn't be moved with dynamite. Either he hasn't gotten the point or else he is just plain stubbornly opposed to it. Handle him by

stating that you're moving for consensus and leave it to the other members of the group to straighten Henry out. Tell him you'll be glad to discuss his views in your (or his) office at a later hour and ask him to accept the group's viewpoint for the time being.

Dave Dampener: Longtime friend of Danny Dolittle, Dave is adamantly opposed to any change or new ideas, aiming instead for status quo. Dave seldom offers any solutions to problems but prefers merely to point out flaws in any new ideas. Handle him by asking him to suggest an alternative that does not include remaining forever in anonymity. Restate the good features of the proposal Dave objects to and go on to others for comment.

Loquacious Larry: This sidekick of Chatty Charles differs in one respect—he never discusses

the subject at hand. Beginning his remarks with, "This may not be exactly what you had in mind, but—," Larry quickly branches out and ignores the subject at hand, reducing your main points to "rambling wrecks" as he goes. Handle him by telling him that his points are interesting; however (smiling at Larry pointedly), "we are a bit off the subject." As a last resort, simply state time will not permit further dawdling and press on.

Daydreaming Dan: This guy ignores everyone and everything and sleeps with his eyes open. Daydreaming is his specialty. While he disturbs no one with his inattention, he should not be allowed to woolgather openly. Handle him by asking him direct questions or asking him to comment on the previous response of another aviator in the meeting. Avoid embarrassing him, if possible, but keep on gently prodding him into alertness.

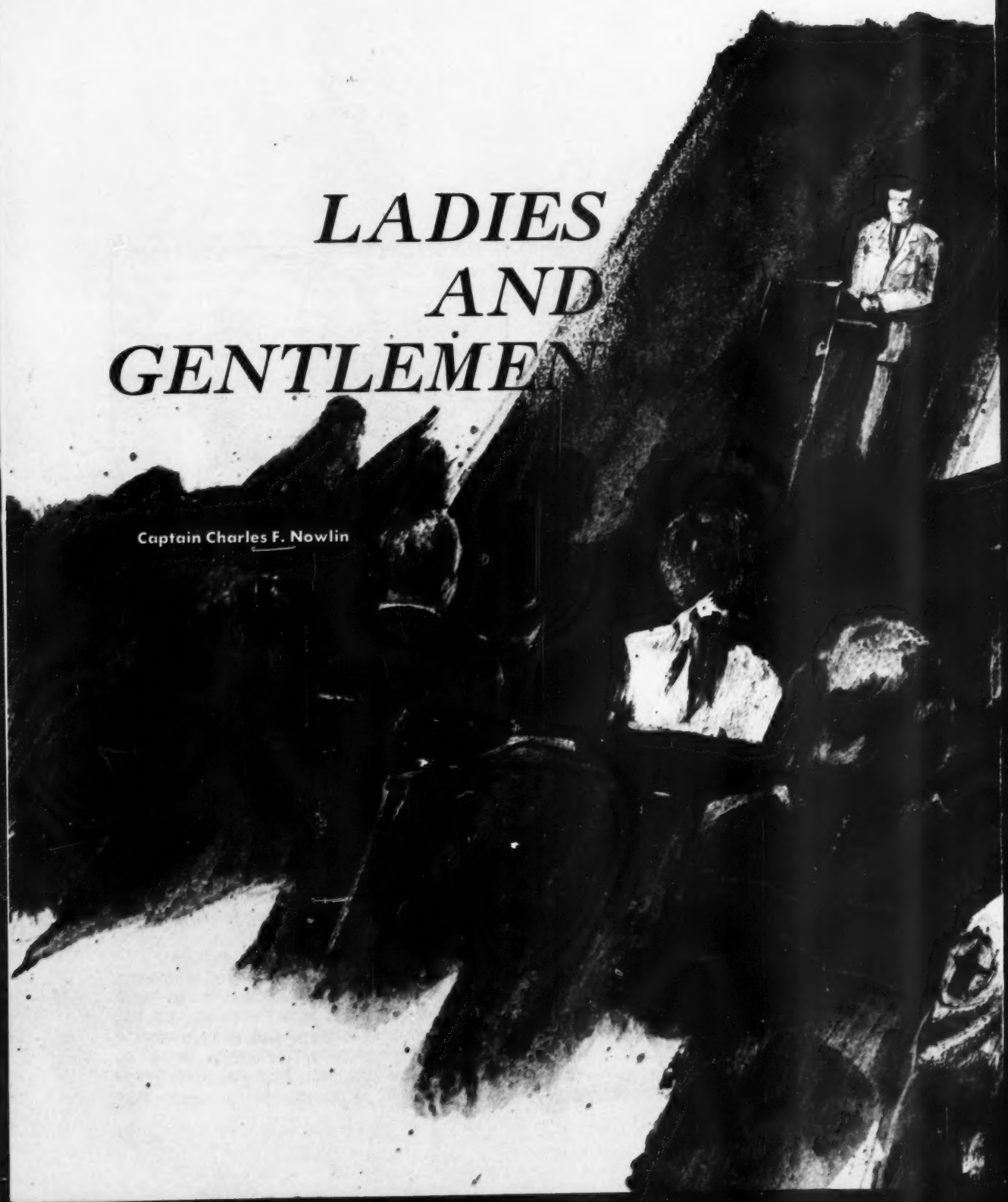
Gregory the Gripe: Sings duets with Clyde Complainer and usually not in harmony with the group. This guy wastes time by loudly griping over pet peeves whether or not they are related to the subject. Handle him by reminding him you aren't the

policymaker or the chaplain here and that he should voice his complaint to the commander. Press on.

There are other categories of communications "in-experts" whom you may encounter who will, by one method or another, attempt to disrupt, confuse or confound your monthly aviation safety meeting. Although they can't be ignored, classroom disrupters should not be encouraged. Aviation safety officers should handle them with the question and answer technique and then press on.

To be sure, the content of the aviation safety meeting is very important, as much so as the manner of presentation. The choice of subject matter is too broad and much too lengthy to be covered here. But you can make your safety meeting more acceptable to your audience by using the two-way method of communication and by being brief and productive in all presentations.

LADIES AND GENTLEMEN



Captain Charles F. Nowlin

Captain Charles F. Nowlin was graduated from flight school in June 1970 and assigned to the 158th Assault Helicopter Company, 101st Airborne Division, Republic of Vietnam. In October he was transferred to the 1st Brigade Scouts of the 101st. In December 1970, CPT Nowlin's OH-6 helicopter was downed by enemy fire and burned, and he sustained third-degree burns to 35 percent of his body. He was evacuated to Phu Bai, then to Camp Zama, Japan, and finally to Brooke General Hospital, where he underwent 3 years of plastic surgery. In March 1972, he was assigned to the 507th Medical Company (Air Ambulance), Fort Sam Houston, TX, and in July 1973 he returned to flying status. He received the Fifth Army Aviation Safety Award in 1973, the AAAA Fifth Army Regional Aviator of the Year Award for 1973 and the James H. McClellan Aviation Safety Award for 1973-1974. CPT Nowlin has completed the Army Aviation Safety Officers Course at the University of Southern California and is now assigned as a platform instructor in the Officer Instructional Division, U. S. Army Agency for Aviation Safety, Fort Rucker, AL

"LADIES AND GENTLEMEN" . . . Familiar words? You bet! We hear them every time a speaker rises to address us. Well, almost every time. We don't always hear the word "ladies" mentioned at aviation safety conferences. And for a good reason—none are usually present. Wives who accompany their husbands to such conference sites generally end up being whisked off on some guided tour of flower shows, museums and the like, leaving their spouses free to pursue man's business of dealing with the safety problems at hand.

Times have changed. In the future, we may find many wives participating in these conferences with their husbands. And it won't be because of women's lib, but because of the realization that a wife's role is of paramount importance to her husband's well-being and to the success of the safety program. Oddly enough, this realization was not reached as a result of extensive research, but rather by the independent actions of the wife.

In my travels to speak to aviators, I have repeatedly noted that when ladies are present, they are, by far, the most attentive audience. In almost every instance, it is their first aviation-oriented classroom encounter where they receive an insight as to what their husbands' jobs are really like. Usually, the most basic facts relevant to flying have never been explained to them—why, for example, flight personnel need the specialized services of a flight surgeon as opposed to those of a general practitioner; the lingering effects of common household drugs; the hazards associated with using home remedies; the possible results of an innocent cocktail party the

night before an early morning flight; the need for a healthy body and mind, and common factors that affect each; how problems at home can set the stage for a serious aircraft accident. . . .

The impact a safety conference has on women can best be expressed in the words of an Air Force colonel's wife who was invited to join her husband at an Army National Guard conference. She said: "I have been attending conferences like this one for more than 18 years, and this is the first time I was not 'farmed out' to fashion shows or sent on other tours where I never gained any insight as to what really goes on at these meetings. This time I was a participant and I honestly learned a great deal about my husband's job—things I should have known years ago. In addition, I learned how to apply safety principles in my own home." She then concluded, "Thank you for a long-overdue eye opener."

This type of reaction is typical, and the reasons for it are so obvious we should have noted them long ago. Unfortunately it has been the old story of "not being able to see the forest for the trees." Have you ever found yourself sweating out an annual written examination and had your spouse ask, "What are you worrying about? You've taken hundreds, haven't you?" Or, "What do you mean, night fly? . . . Minimums? What's that? . . . You said you'd be home at 10 o'clock. What the heck does weather have to do with it? . . ." Well, I don't know about you, but I have been married for less than a year, and during this relatively short period of time I've had these and other similar questions thrown at me. And you know what? It's our fault. First, we fail to inform our wives, and then we expect them to understand in a few minutes what took us years to learn. Is it any wonder they hunger for an inside glimpse of what flying is all about? And make no mistake about it, they are starving for information.

At one particularly successful aviation safety presentation at Ft. Carson, CO, I was surprised during my portion of the presentation to note that my audience had been infiltrated with women. But my greatest surprise came during intermission when I noticed these women had formed a group. I figured I had bored them long enough and they were going to take advantage of this opportunity to exit gracefully. I was dead wrong. Instead of leaving, they took their husbands in tow and moved to the front where they could see and hear better.

Two weeks later I was asked to address the Oregon Army National Guard Aviation Safety Conference in Salem, OR. At my suggestion, the wives were invited to attend the conference along with their husbands. They attended lectures given by MG Francis S. Greenlief, who at that time was chief of the Army National Guard Bureau; the state aviation officer; and the local sheriff who presented the aviation unit with a coveted civilian valor award and a "well done, we thank you sincerely" for the rescues the unit performed during the previous year. The ladies were there; they were participating; they were seeing what their husbands were accomplishing; and they were being informed.

That afternoon, they were taken to the aircraft hangar for a tour of the facility while the aviators and crewmen attended classes on life support equipment and standardization. When I rejoined them, I found they had been briefed by the flight surgeon and shown a film depicting their husbands' lifesaving missions performed during the previous months. I found them to be a most warm, interested and receptive audience filled with questions and comments. What was even more important, I found them enthusiastically supporting Army aviation.

That afternoon the ladies were extended an invitation to join their husbands for the events scheduled early the following morning. It was a verbal invitation given more or less as a matter of courtesy, for we all knew they would be anxious to take advantage of the opportunity to sleep late. We were wrong. They were present in full force, and they were not disappointed. They viewed a film dealing with helicopter operations and attended a presentation on survival conducted by an expert, CW2 Frank Heyl, director of outdoor education for the Oregon Museum of Science and Industry. Without a doubt, this was one of the most successful safety conferences I ever attended. And it was due, in great measure, to the wives present and their concern for the subject matter.

I personally feel it is time we include our wives in all conferences of this type. It is the type of informative affair that can be conducted by every aviation unit whether it be Active Army, Reserve or National Guard. And it can provide immense benefits to both individual families and Army aviation. Ignorance is our greatest enemy, and informing the wife in aviation matters is a most effective way of combating it. So, the next time you begin making preparations for such a conference—if you truly want it to be effective—plan it so that when the speaker climbs upon the platform to make his opening address, you will hear those old familiar words: ladies and gentlemen!

USAAAVS
If you have a question concerning aviation accident prevention, write to Commander, USAAAVS ATTN: Orval Right Fort Rucker, AL 36360
OUT
IN
Write to Right

Aviator Records

Will the U. S. Army Agency for Aviation Safety (USAAAVS) provide an aviator's accident record which can be compiled from aircraft accident investigation reports to a collateral investigation board?

No. Paragraph 7-1d, AR 95-5, C3, states: "An Aircraft Accident Investigation Report is an official Army document to be used solely for aircraft accident prevention purposes. . . . Accident reports cannot be used: as evidence or to obtain evidence in determining the misconduct or line-of-duty status of any personnel; as evidence before evaluation boards; as evidence to determine liability in claims against the Government; or as evidence to determine pecuniary liability. . . . These reports and their attachments, or copies and extracts, will not be appended to or inclosed in any document or report unless the sole purpose of these reports or documents is accident prevention." As stated in paragraph 8-1b, AR 95-5, C3, the collateral investigation "determines culpability which provides a basis for administrative or judicial proceedings pertaining to punitive or compensatory actions, establishes eligibility for death gratuities, and assists in line-of-duty determinations." Since two investigations are diametrically opposed, military members are prohibited from using information prepared by the aircraft accident board in a collateral investigation.

However, accident information can be obtained from the aviator's Individual Flight Records Folder (IFRF) (par. 3-9, AR 95-64). The accident investigation board recorder is personally responsible for entering all pertinent accident information on the aviator's DA Form 759, which is a part of the IFRF.

Where can an investigation board get information about an aviator's flying record?

The first place to obtain an aviator's flight records is from the Individual Flight Records Folder, prepared in accordance with chapter 2, AR 95-64. The folder should be obtained through the individual aviator's commander. Should the IFRF be nonexistent or incomplete, provisions for reconstructing the folder are contained in par. 2-3, AR 95-64. Essentially this paragraph says that USAAAVS will provide information from the aviator's DA Form 759 for which it is responsible under par. 1-2b, AR 95-64.

Pin-on Insignia

It has been brought to my attention that pin-on rank insignia worn on duty uniforms by aviation personnel pose a potential safety hazard.

Fasteners which secure the pin-on and the pin-on itself have fallen from attached positions without the wearer's knowledge. It is conceivable that these items may fall into partially disassembled engines and transmissions, creating an insidious form of FOD, since the wearer of the insignia is totally unaware of the missing item. Additionally, the small size of these items prevents them from being readily seen.

The most practical solution seems to be for aviation personnel to wear sew-on insignia. However, I have not been able to locate an authorization for the wearing of sew-on insignia by enlisted personnel. Can you offer some suggestions on this problem area?

USAAAVS concurs with your comments concerning the potential safety hazard posed by wearing metal insignia on flight clothing. This agency recommended a change to Army Regulation 670-5 in June 1973. The Army Uniform Board voted to continue use of the metal insignia on 16 May 1974. However, the Board directed the proponent agency to research the problem and the Board would consider the recommended change at the November 1974 meeting. Recommend you submit a change to the regulation on DA Form 2028.

TALES FROM THE TROJAN

The following three stories were written by members of a recent Communications Skills class of COL Daniel M. Lewis (USAF, Ret.), Institute of Aerospace Safety and Management, University of Southern California

PRESSURE AND PROFESSIONALISM

HERE'S PROOF THAT unprofessionalism can be caused by pressures exerted from outside sources. I arrived at flight operations 2 hours early to begin flight planning for a mission I was assigned and briefed on the day before.

The mission was to fly to Memphis, TN, pick up three VIPs and return to my home base. During the mission briefing, the commander repeatedly stressed the requirement for the VIPs to arrive at our home station that evening.

After completing my IFR (instrument flight rules) stopover flight plan, I went to the weather room for a weather briefing. The weather officer said we would have to cross a cold front between the home station and Memphis, but that it contained only scattered to broken layers with tops from 6,000 to 8,000 feet and would be no factor in reaching my destination. He did state, however, that my return trip could be difficult. There was a probability the line would develop into a more intense line and there was a chance of scattered thunderstorm coverage of 10 to 30 percent.

With the weather briefing completed and my flight plan filed we preflighted our U-8, paying particular attention to the anti-ice systems. Also, I noted a writeup on the 2408-13 that the radar was intermittently inoperational, but this shortcoming had been corrected and signed off.

After runup, we departed and flew to Memphis. The weather along the route was as forecast. When we arrived at Memphis we learned that our passengers were going to be 30 minutes late so we shut down the aircraft and went into the terminal to wait. I went to the Federal Aviation Administration (FAA) weather station to get an update to my weather. FAA personnel said the weather was about as forecast but they were starting to get pilot reports of thunderstorms along our route. I asked about the possibility of going VFR (visual flight rules) below the system or around it to get to my home station. They said

that was impossible and that the system would remain between me and my home station for the next 24 to 36 hours.

When I returned to the passenger terminal the VIPs were just arriving. I briefed them on the weather situation and the possibility of not making it back to our home station. Again I was pressured to get back that night.

We returned to the aircraft, loaded, received our clearance and departed. We climbed to 7,000 feet and leveled off. We could see that a line of cumulus clouds had formed ahead of us. When the radar warmed up and came on it didn't look bad ahead—a few spots on the 60-mile range but widely scattered. However, because of the writeup on the dash 13, I requested a weather check from Memphis Center. They said they had a small line but thought they could vector me through it. As we approached the front our radar began to show more weather but there were still sufficient gaps between cells to get through. The closer we got the worse it looked.

This is where command pressure entered the picture. If it had not been for that, I would have returned to Memphis. We entered the clouds at 7,000 feet and turbulence penetration speed for the U-8F. After 5 minutes, an unforgettable educational period began for my passengers, copilot and me.

It started with Center giving us heading changes and the formation of moderate clear ice. I requested a lower altitude to get out of the ice, but it was not available so we remained at 7,000 feet. Our radar was showing several small cells but nothing heavy. However, I noticed we always had a small cell at 12 o'clock, regardless of our heading.

The turbulence began to get rougher from light to moderate. All of a sudden our radar brightened like someone had turned a light on behind it. The freezing rain turned from light to heavy, ice was accumulating rapidly, and turbulence was moderate to heavy. Airspeed went from 90 to 160 knots, changing back and forth rapidly, and the climb indicator and altimeter indicated ascents and descents of 2,500 feet

per minute or more. Altitude and airspeed control was impossible so we notified Center and they blocked altitudes 5,000 to 9,000 for us. Center said we should be out of it in 12 to 15 miles. It was the longest 12 to 15 miles I've ever flown. It was all we could do to hold the aircraft straight and level. After what seemed like years we came out of it, covered with ice and completely exhausted.

It has been said that hindsight is always better than foresight and, looking back, what did I do wrong? You could say it was when I elected to go into a line of weather, or when I didn't turn back, or for that matter, even leaving Memphis. I also believe that it was wrong for pressure to be applied to complete the mission. Too often, undue pressures are applied by people who are not going to experience the risk themselves, as in the case of the commander, or by someone in authority who is not really familiar with the risks involved. I know that, according to regulations, the final decision rests with the pilot in command, but this can sometimes result in the old adage "damned if you do and damned if you don't." What I'm trying to relate, especially to commanders, is that it is sometimes hard to "be professional" under undue pressure which often comes from the "can do" attitude of someone else. The next time you tell someone to be professional, ask yourself if you allowed him the latitude he needs to be a "professional."

THE POSTER AND THE PILOT

NO DOUBT YOU have all glanced at the aviation safety posters prominently displayed in operations or in the briefing room. But how many of you take an extra minute to fully understand the message of each poster? You should take the time. One of these posters may save your life some day. Here is how one may have saved my life.

A few years ago the Army inventory included a large number of CH-34 helicopters. During that time I saw a poster that really impressed me because I was serving as maintenance officer/test pilot on the CH-34s.

The poster showed a CH-34 that had rolled over on its side. The accident was maintenance-related. One of the primary servos had been changed and the hydraulic pressure and return lines were reversed when the new servo was installed. The error should have been detected by the mechanic, crewchief, maintenance supervisor, technical inspector or maintenance officer/test pilot, but all of them missed it. I couldn't understand how the error could go undetected by so many individuals.

Years later I was serving as assistant maintenance officer in a small direct support shop. We were under pressure getting six UH-19s ready for transfer to National Guard units. One of the birds had a 1:1 vibration and I had just completed the main rotor tracking and was getting out of the aircraft when I noticed a hydraulic leak. It was a bad leak at the right forward servo. I did the writeup to red X the aircraft and passed the word on to a civilian mechanic and the maintenance noncommissioned officer (NCO).

The next day the same UH-19 was ready for test flight. I checked the book closely and found that the servo had been changed by an experienced civilian mechanic. The inspection was signed off by the technical inspector (TI) and the aircraft was ready for a runup maintenance operational check (MOC).

I questioned the mechanics as to why the transmission cowling had been installed already without the MOC. They laughingly told me they had confidence in their work and that the new servo couldn't leak. I reluctantly went along with them and climbed up the side of the aircraft. I put one leg inside the cockpit and stopped right there.

That CH-34 poster I had seen years before started flashing through my mind like a neon sign. I told a mechanic to remove the cowling so I could take a

take a minute for aviation safety

look at that servo installation. You guessed it! The hydraulic pressure and return line were reversed on the servo. Needless to say, I had an impromptu safety meeting with a few maintenance people.

So the next time you see an aviation safety poster, take an extra minute to get the full message. It could be the one that saves your hiney.

A BELIEVER

SO YOU SAY YOU don't believe or have much faith in the Army Oil Analysis Program (AOAP)? Let me tell you about an Army aviator who does believe in the AOAP effort and how he came to have such faith.

He was the pilot of a CH-47 at a sister service installation supporting a test program on a new artillery weapon system. They had been away from home station 17 days. During this time, the crewchief had taken oil samples from various aircraft gearboxes as required, but had some difficulty in dispatching the samples for analysis. Part of the difficulty was the pilot's attitude toward the AOAP. He was reluctant to place much importance on something he felt was a minor requirement. After much persistence from the crewchief, the pilot finally arranged for the oil samples to be forwarded for analysis.

Four days later the crew was given the mission of transporting a defective weapon component to the factory for exchange. On takeoff, all aircraft systems appeared to be operating normally and all instruments were in the green. At 600 feet of altitude on climbout, a noise like a shotgun was heard from the vicinity of the forward transmission and communications on the intercom were impossible due to the constant grinding and rattling noise from the transmission area.

The pilot entered a power-on autorotation to an open field and the copilot performed a hasty prelanding check. By making an abrupt deceleration near the ground, the pilot was able to make a successful minimum power landing to the level sod surface of the field. The copilot immediately shut off both engines as soon as all forward motion had stopped. The rotor made two and one-half turns before the forward transmission seized to the extent that the crewmembers were forced sideways in their seats. The crewchief was unable to reposition the rotor blades for mooring.

The pilot contacted home station by telephone to report the forced landing and was immediately informed that his unit had been trying to contact him since early that morning to tell him the aircraft was grounded. The oil sample taken from the forward transmission had been analyzed and excessive metal content was found in the oil. The Oil Analysis Laboratory had recommended the immediate change of the forward transmission on this aircraft.

I don't mind telling you that I was the pilot of that aircraft and I now believe in the AOAP effort and support it wholeheartedly. Every time someone starts to tell me how ineffective he believes AOAP to be, I remember the look on the face of my crewchief when I told him about the information our unit was trying to pass to us while we were needlessly risking our lives in an aircraft that should have been grounded several days before this flight. I know the crewchief wanted to say, "I told you so."

Distress Marker Light

As a downed crewmember, your rescue could depend on your 8-ounce distress marker light, FSN 6230-938-1778, a component of the survival vest. When furnished with the survival vest, this strobe light comes complete with battery and flash guard, which contains a blue translucent filter in one end. However, when the light or its components need replacing, they must be requisitioned individually.

In accordance with CTA 50-970, dated July 74, certain ground personnel are also authorized a strobe light, FSN 6230-067-5209, with a canvas carrying case which is attachable to the belt. This strobe light is identical to the light authorized for aircrewmembers, except that it has a different federal stock number.

To ensure that your strobe light is in working condition in the event it is needed, check the light regularly. The only maintenance required is at the organizational level. This includes cleaning inside the case at the battery contact and changing the battery. To perform this maintenance, check the battery contact for rust, dirt or corrosion. Either a pencil eraser or a wire brush can be used to clean the contact. Also, use a small amount of silicone grease to stop the build-up of rust or corrosion. Check the battery for cracks, dents, leakage and manufacture date. If 24 months have lapsed since the date of manufacture or there is evidence of defects, the battery should be replaced.

In addition, check the lens and flash tube for cracks and distortion and the rubber switch boot for cracks and looseness. If any are found, then you need to order a new light.

Following are the federal stock numbers to use to requisition the strobe light and its components. Both strobe lights use the same flash guard and battery.

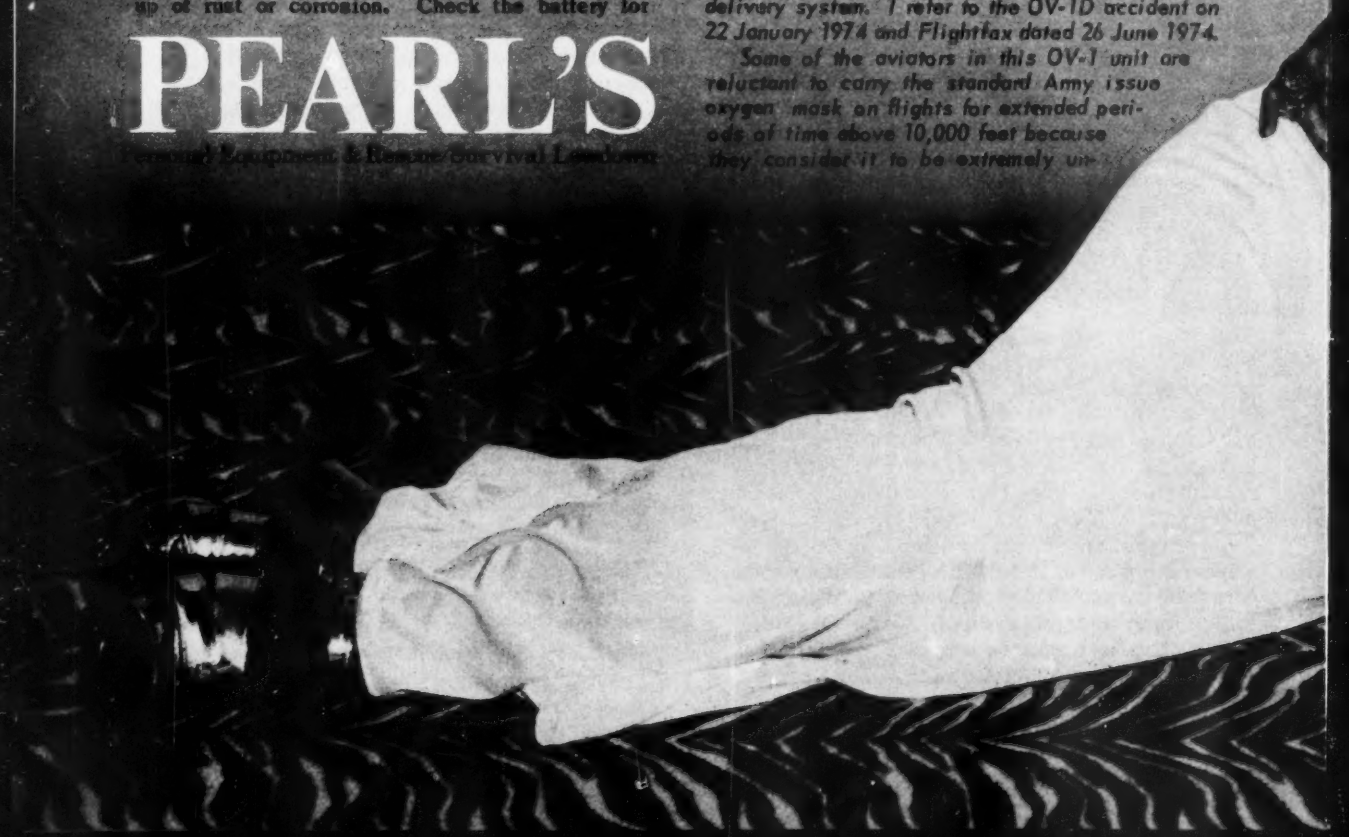
- Light, Marker, Distress (for aircrewmembers only), FSN 6230-938-1778, P/N SDU-5/E
- Light, Marker, Distress (without battery) (for authorized ground personnel only), FSN 6230-067-5209, P/N SDU-5/E, with Case, Light, Marker, Distress (canvas carrying case), FSN 6230-060-8125
- Flash Guard, FSN 6230-401-2285 (replaces flash guard, FSN 6230-917-6692)
- Battery, Mercury, FSN 6135-073-8939, P/N BA-1574/U

Oxygen Masks

Two mishaps have occurred recently which may indicate the need for an improved oxygen delivery system. I refer to the OV-1D accident on 22 January 1974 and Flightfax dated 26 June 1974.

Some of the aviators in this OV-1 unit are reluctant to carry the standard Army issue oxygen mask on flights for extended periods of time above 10,000 feet because they consider it to be extremely un-

PEARL'S



comfortable as well as restrictive to vision while attempting adjustments on the lower (center) radio console. They prefer to take oxygen directly from the hose. Others have managed to obtain lighter, more comfortable, less restrictive masks from other services. Is any research being conducted by the Army to determine the feasibility of introducing oxygen masks of sister services into Army supply channels?

The United States Army Aeromedical Research Laboratory (USAARL) located at Fort Rucker, AL, is evaluating the following oxygen masks for adoption and use by the Army:

- U. S. Air Force–MBU-5P oxygen mask
- U. S. Navy–756 pressure oxygen mask
- Sierra–prototype 1 side entrance oxygen mask

The USAF mask is an improved version of the A-13A mask currently used by Army aircrewmembers. The USN and Sierra masks are side entrance models. The side entrance system will possibly eliminate the problem of the sticking exhalation valve. The USAARL technical report on the oxygen masks was to have been distributed in September 1974. A copy of the report or additional information can be obtained by writing Commander, USAARL, ATTN: Bio-chemistry Section/LT McNeil, Fort Rucker, AL 36360.

Until a new mask is introduced in the system, the U. S. Army Aviation Center recommends the oxygen mask, FSN 1660-809-0390, with adoption-harness assembly, FSN 1660-179-1191, be used in all cases where oxygen is required. The practice of taking oxygen directly from the hose is discouraged and pure oxygen in the cockpit would provide fuel to any fire that might be ignited. The use of sister service masks is not recommended until approved and adopted by Department of the Army. However, this agency recommends Equipment Improvement Recommendations (EIRs) be submitted on the mask or other items of equipment in the inventory which do not perform as designed or do not fulfill their intended mission.

USAAAVS

If you have a question about personal equipment or rescue/survival gear, write Pearl, USAAAVS, Ft. Rucker, AL 36360

USAASO Sez

The U. S. Army Aeronautical Services Office discusses

Missed approach
Decision height
Altimeter setting

Missed Approach Point (MAP) In Precision Approach Procedures: Some aviators may execute a missed approach early and others late because they have been led to believe the missed approach point (MAP) and middle marker (MM) positions are collocated in all ILS procedures. Misapplication in the first instance may result in an unnecessary missed approach and aborting of the mission; the latter is a hazard to safety.

The MAP in precision approach procedures (PAR/ILS), also known as the decision height (DH), is an elevation related to the glide slope published as a minimum descent altitude. Approach below and beyond this point is permitted only under visual conditions. The DH is published for pilot use in procedures and should be responded to in flight through cross-check with the altimeter.

Middle markers associated with ILS systems may ideally be located at a point equal to the distance of the DH from the threshold. More often than not they are beyond or short of the ideal position as a result of siting or other problems. Available real estate, propagation of signal quality, powerline requirements, maintenance and security considerations are but a few. At some locations the design DH position may have been changed because the glide slope angle was elevated to satisfy operational or obstruction considerations. This results in arrival at the DH after passing the marker.

In radar procedures additional notification of arrival at the lowest DH may be provided by the controller. This also occurs when PAR is used to monitor ILS approaches. Due to acceptable technical error in radar procedures, glide slope presentation and in altimeter systems, the DH indications received by the aviator may differ due to the different methods used for detection. Pilots should respond to the first indication available to assure protection from obstructions unless visual conditions are encountered and the approach to a landing is continued.

Aviators should not use MM beacons to determine the DH. These beacons serve as a "bell clangor" only. Study of a procedure prior to final approach is recommended to determine if the marker signal will be received either prior to or during the visual segment of the ILS approach. This will help the pilot in decision-making and improve time and distance perspective at a most critical period in IFR flight.

USAASO Sez: Use correct altimeter setting procedure. Lead the lag. Fly the numbers. Don't get embedded in an obstruction while waiting for a beacon signal that may not be seen or heard.

You're *not* getting the DIGEST?

Complete DA Form 12-5 and send it to the appropriate address (see inside front cover below Table of Contents)

TRAINING TACTICS

THIS MONTH the DIGEST's theme is tactics-training; next month it will be training-tactics. Of course, the idea is that tactics and training are inseparable, no matter which you mention first.

This issue features the 101st Division (Airmobile) which chose to accent unit training. Next month the training-tactics theme will be emphasized in an article by Major General William J. Maddox, Jr., commander of the U. S. Army Aviation Center at Fort Rucker, AL. The DIGEST also will feature training articles from the U. S. Army Forces Command and the Aviation Center.

This is the fourth of 12 back covers designed to show personal survival, rescue and protective equipment. Detach this cover for your bulletin board display of the more important survival and protective equipment available to crewmembers.

USAAAVS
4 OF 12

Pearl is holding the 8-ounce distress marker light, a valuable aid in air search and rescue of downed crewmembers. This strobe light, as a component of the survival vest, comes complete with battery and flash guard which contains a blue translucent filter in one end. Replacement light and components must be requisitioned individually.

- Light, Marker, Distress (for aircrewmembers only), FSN 6230-938-1778, P/N SDU-5/E
- Flash Guard, FSN 6230-401-2285
- Battery, Strobe, Mercury, FSN 6135-073-8939, P/N BA-1574/U

Other signaling devices available:

LIGHTS

- Flashlight (red flashing light), 6-volt battery, FSN 6230-577-3452, CTA 50-900
- Flashlight (right angle), MX991/U, 2 D batteries, FSN 6230-264-8261, CTA 50-900
- Flashlight (nickel plated, unbreakable, yellow, plastic wand), 2 D batteries, FSN 6230-926-4331, CTA 50-900
- Flashlight (safety), 3 D batteries, FSN 6230-270-5417, CTA 50-900
- Flashlight (pilot penlight), 2 AA batteries, FSN 6230-171-3362, CTA 50-900
- Flashlight (patient exam, disposable), no batteries needed, FSN 6230-125-5528, AR 40-61

BATTERIES

- Battery, dry cell, size 6 volt BA-230/U, FSN 6135-100-0459
- Battery, dry cell, 1.5 volt, size D BA-30, FSN 6135-120-1020
- Battery, dry cell, 1.5 volt, size C BA-42, FSN 6135-120-1010
- Battery, dry cell, 1.5 volt, size AA BA-58, FSN 6135-120-1030